The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 127, No. 10 — CHICAGO, ILLINOIS — MARCH 10, 1945

COPYRIGHT, 1945, BY AMERICAN MEDICAL ASSOCIATION

THE USE OF INSULIN AND THE ABUSE OF GLUCOSE

IN THE TREATMENT OF DIABETIC COMA

HOWARD F. ROOT, M.D.
BOSTON

Deficiency of insulin is the cause of diabetic coma. Anew this has been demonstrated by the discovery of experimental alloxan diabetes,[1] in which diabetic ketosis and coma result when the islands of Langerhans which secrete insulin are destroyed. Here is a new method for the production of diabetic coma in its pure and uncomplicated form. Insulin cures coma because it enables the body to utilize glucose present in the blood and fluids of the tissues. It restores glycogen depots and provides energy for the body by oxidation of carbohydrate instead of fat and so stops excessive ketone production. If one would only appreciate this action of insulin, the administration of excessive glucose intravenously and by mouth with its lethal effect in patients with severe diabetic coma would be ended and more recoveries reported. My associates and I are so impressed by the reported high mortalities in diabetic coma published by those who treat it with glucose as compared with our recent series of 123 successive cases between Oct. 21, 1940 and May 1, 1944 with but 2 deaths treated without glucose that when we hear of a diabetic coma death our first question is "Did the patient receive glucose?"

In this paper I wish to present new observations and refer only briefly to such data from the series of 601 coma cases that ended May 1, 1944 as have not been given in previous reports.[2]

DECLINE IN MORTALITY

We naturally take pride in the fact that but 2 deaths in coma have occurred in the last 123 consecutive cases observed up to May 1, 1944, a percentage of 1.6 in contrast to 12 per cent for the 478 earlier cases (table 1). We attribute our low mortality to the more rapid administration of insulin in larger doses in the first three hours after admission to the hospital. The steady increase in dosage from 83 units to an average of 216 units during the first three hours of treatment has been due to a recognition of two facts: (1) the value of insulin is greatest early in treatment, and (2) complications formerly regarded as lethal may be more successfully treated if coma is rapidly controlled. The maximum dose given in twenty-four hours was 1,410 units, but the average doses in twenty-four hours were 237 and 287 units for the two series. It is the insulin given in the first hours of treatment which counts most heavily.

TWO COMA DEATHS WITH AUTOPSY

A girl aged 19 years (patient 43) was transferred from another hospital on April 10, 1943 in coma of thirty hours' duration complicated by sinusitis. On arrival she was profoundly unconscious with soft eyeballs, anuric, the blood sugar was 534 mg., blood carbon dioxide 11 volumes per cent and the rectal temperature 101.4 F. With intravenous fluid and insulin, 200 units, the blood sugar fell to 190 mg. Death occurred five hours after entry. A complete postmortem examination was obtained, including the brain. The anatomic and microscopic diagnoses were purulent sinusitis, sphenoid and ethmoid; early bronchopneumonia, right; atherosclerosis of aorta; simple cysts of ovary, right; remote appendectomy. The immediate cause of death was sepsis due to infection with hemolytic Staphylococcus aureus.

A youth aged 19 years (patient 52) in coma of twenty-two hours' duration had received 400 Gm. of glucose in another hospital during the first twelve hours of treatment for undoubted coma. Then because of his downward progress insulin, inadequate in amount, was employed. On admission to the Deaconess Hospital the blood sugar was 680 mg., blood carbon dioxide 23 volumes per cent, nonprotein nitrogen 73 mg. He received 320 units of crystalline insulin. Death occurred in nine hours. Autopsy was negative. Death was due to delayed and inadequate use of insulin. (This is the exceptional case referred to in table 1.)

ACETONE BODIES IN THE BLOOD

An abnormal concentration of acetone bodies in the blood is an essential feature of diabetic coma. It is usually proportional to the severity of coma and the amount of treatment required for recovery; this is especially so if due allowance is made for the fact that the susceptibility of the brain to acidosis will be affected by the age of the patient, by the duration of the diabetes, by the presence or absence of acute infection and especially by such other factors as coexisting arteriosclerosis and nephritic lesions. In table 2 are listed determinations of total acetone bodies in the whole blood in a series of 31 cases of diabetic coma in which the blood carbon dioxide content was 20 volumes or less and 10 cases of ketosis in which the blood carbon dioxide content had not reached the coma level of 20 volumes per cent. The determination gives the total amount of acetone, diacetic acid and beta-oxybutyric acid in the whole blood expressed as milligrams of acetone per hundred cubic centimeters of blood. This series is arranged with the highest values for blood acetone bodies first and in the descending order. By unconsciousness is meant a state in which the patient is

From the George F. Baker Clinic, Elliott P. Joslin, medical director, New England Deaconess Hospital.

Read before the Section on Practice of Medicine at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Dunn, J. S.; Sheehan, H. L., and McLetchie, N. G. B.: Necrosis of Islands of Langerhans Produced Experimentally, Lancet **1**: 484, 1943. Bailey, C. C., and Bailey, O. T.: Production of Diabetes Mellitus in Rabbits with Alloxan, J. A. M. A. **122**: 1165 (Aug. 21) 1943. Joslin, E. P.: Medical Progress: Diabetes Mellitus, New England J. Med. **230**: 425, 1944; ibid., to be published.

2. Joslin, E. P.; Root, H. F.; White, Priscilla, and Marble, A.: Diabetic Coma, J. A. M. A. **119**: 1160 (Aug. 8) 1942.

completely unresponsive to even painful stimulants and does not resist such measures as the passing of the stomach tube. Patients listed as drowsy would respond to questions, but in most instances after recovery they would not remember the passing of the stomach tube or any other incidents for a period of a day or two during acidosis; that is, cerebral function was very seriously affected. Patients who were conscious did have dyspnea but were quite able to cooperate.

The state of unconsciousness did not occur with acetone values under 100 mg. with a single exception. A girl aged 19 years (patient 43) arrived unconscious and anuric. Her death was due to a purulent involvement of the sinuses with obstruction of the nasal passages. The low concentration of acetone bodies is consistent with the disappearance of acetone bodies in the urine during the last few hours of life in severe acidosis and is in some way related to the terminal cachexia of diabetes and severe infection. In a series of 21 patients with blood acetone values of over 100 mg., 10 were female, 11 male. Only 2 were over the age of 40 years. A patient aged 72 years had an adenoma of the thyroid with hyperthyroidism; another patient aged 60 had diabetes for twenty years. It was these two older patients who were unconscious with blood acetone values of 104 and 125 mg. The duration of diabetes varied from two years to nine years. The highest blood sugar values and the highest insulin doses were required in the groups with the highest blood acetone values. The average blood sugar for the patients with blood acetone values above 140 mg. were 748 mg. Insulin requirement for the first twenty-four hours for this group of patients was 553 units, but 1 patient received only 126 units. The effect of impaired renal function in bringing about retention of acetone bodies is shown by a woman aged 76 years who entered with gangrene and auricular fibrillation. The blood acetone value was 133 mg., yet the blood carbon dioxide content was 38 volumes per cent. The nonprotein nitrogen was 61 mg., yet she made a good recovery after thigh amputation.

The rapidity with which the concentration of total acetone bodies in the venous blood of patients declines under treatment for diabetic coma deserves further

TABLE 1.—*Decline in Mortality in Diabetic Coma*

	478 Cases January 1923 to August 1940	123 Cases August 1940 to May 1, 1944
Number of deaths	58	2
Percentage of deaths	12	1.6
Age, average	29 years	29 years
Duration of diabetes	4.3 years	6.3 years
Blood sugar	490 mg.	500 mg.
Blood carbon dioxide, average *	12 vols. %	13 vols. %
Nonprotein nitrogen, average	45 mg.	51 mg.
Insulin (first 24 hours)	237 units	287 units
	1923-1927	1932-1934	1942-1943
Insulin in first 3 hours of treatment	83	136	216

* Only cases showing blood carbon dioxide values of 20 volumes per cent (8.8 millimols) or less are included with the exception of case 52.

study. In this series the fall in acetone body concentration roughly parallels that in the blood sugar. A youth (No. 5, table 2) entered in coma with a blood sugar of 540 mg., a carbon dioxide of 15 volumes per cent and total acetone bodies of 162 mg. In three hours the blood acetone level fell to 112 mg., while the blood sugar fell to 320 mg., and at the end of twenty-four hours the blood acetone level was 9 mg. and the blood sugar was 70 mg., a result accomplished with 214 units of insulin. This is the typical change in blood acetone bodies, provided sufficient insulin is given to check excessive ketone production by the substitution of carbohydrate for fat in the metabolic mixture, probably

TABLE 2.—*Total Acetone Bodies in Blood in Diabetic Coma and Precoma*

January 1939-January 1944

No.	Mental State	Blood: Acetone, Mg. per 100 Cc.	Blood: Carbon Dioxide, Vols. %	Blood: Sugar, Mg.	Insulin First 24 Hours of Treatment, Units	Age, Yrs.	Sex	Duration Diabetes, Yrs.
1	Unconscious	195	7	1,230	1,770	24	♂	12
2	Unconscious	195	9	720	360	20	♀	7
3	Unconscious	167	11	1,020	770	27	♂	13
4	Unconscious	165	14	510	126	40	♀	11
5	Drowsy	162	15	540	214	16	♂	9
		112	24	320				
		9	43	70				
6	Drowsy	162	14	890	480	16	♂	4
7	Drowsy	144	3	600	308	28	♂	4
8	Drowsy	137	4	780	570	39	♂	4
9	Drowsy	133	38	526	238	76	♀	4
10	Drowsy	133	10	500	380	20	♀	4
11	Unconscious	132	9	780	366	19	♀	6
12	Unconscious	130	9	1,540	1,450	31	♂	9
13	Unconscious	130	13	830	350	15	♂	4
14	Unconscious	125	10	490	240	20	♀	2
15	Unconscious	125	12	700	346	72	♀	4
16	Drowsy	120	18	350	120	31	♂	7
17	Unconscious	118	7	340	108	17	♀	5
18	Conscious	118	16	260	128	18	♂	7
19	Drowsy	111	12	270	180	15	♀	3
20	Conscious	111	17	400	250	22	♀	7
21	Unconscious	104	11	880	380	60	♀	20
22	Drowsy	97	9	470	340	40	♀	9
23	Drowsy	90	10	510	330	39	♀	12
24	Drowsy	88	23	330	120	28	♀	2
25	Drowsy	84	13	360	156	14	♀	3
26	Drowsy	79	10	396	398	19	♀	10
27	Drowsy	79	41	270	150	14	♀	8
28	Drowsy	77	15	600	180	16	♂	11
29	Drowsy	77	5	250	260	46	♀	0.5
30	Drowsy	76	28	230	114	23	♀	8
31	Drowsy	74	9	380	224	50	♀	0.7
32	Drowsy	73	64	380	102	24	♂	11
33	Conscious	70	24	160	148	35	♂	8
34	Conscious	70	18	230	50	14	♀	0.1
35	Unconscious	68	12	500	350	20	♀	0.2
36	Drowsy	60	11	320	192	31	♀	6
37	Drowsy	60	7	290	152	20	♀	3
38	Conscious	58	25	200	124	23	♂	0.2
39	Drowsy	51	27	300	134	14	♀	9
40	Drowsy	46	32	330	256	16	♂	0.1
41	Conscious	44	31	360	90	15	♂	0.6

in part through restoration of more nearly normal hepatic glycogen.

Ketone bodies are normally present in the blood in exceedingly small amounts and are now regarded as normal metabolites. They may be formed from certain of the amino acids (ketolytic amino acids, tyrosine, leucine, isoleucine and phenylalanin) and from fatty acids. It was formerly thought that their production was due solely to the absence of oxidation of carbohydrate. Now carbohydrate oxidation is regarded as antiketogenic; in the absence of carbohydrate more fat is used, with a consequent abnormal increase in the production of these acetone bodies.[3] In an artificially produced ketonemia developing during a fasting cure in 1 case described by Brügel [4] the blood acetone value rose to 19-20 mg. for several days, during which time the patient felt perfectly well. Barach [5] described ketonuria in Marathon runners. The striking difference between the effects of fasting in diabetic patients and in three obese nondiabetic subjects is demonstrated by Dick, Goldner and Singer.[6] The data obtained were compatible with Stadie's theory of a utilization limit for

3. Stadie, W. C.: Fat Metabolism in Diabetes Mellitus, Ann. Int. Med. **15**: 783, 1941.
4. Brügel, H. G.: Ueber das Verhalten des Ketokörperspiegels im Coma diabeticorum, Klin. Wchnschr. **21**: 89, 1941; Chem. Abstr. **36**: 6626, 1942.
5. Barach, J. A.: Am. J. Digest Dis. **10**: 134, 1944.
6. Dick, G. F.; Goldner, M. G., and Singer, T. P.: Observations on Starvation Diets and Hunger Ketosis, Am. J. Digest Dis. **10**: 124, 1943.

fat and a threshold for ketosis. According to Stadie the level below which fat metabolism is complete is about 2.5 Gm. per kilogram body weight daily.

It is a lack of insulin which is essential for the production of diabetic coma. It is easy to produce ketonemia in nondiabetic patients on starvation or on fat diets without carbohydrate, but no serious condition remotely resembling diabetic coma ever occurs in a normal animal or normal human being who has a normal supply of insulin, no matter what method is employed to increase the concentration of ketone bodies in the blood and urine.

As a means of estimating the critical character of diabetic coma the determination of the carbon dioxide content of venous blood continues to be in our experience the most valuable single analysis. The measurement of acetone bodies in the urine is deceptive because of failing renal function. The content of acetone bodies in the blood, while important, is not so reliable as the blood carbon dioxide in determining the degree of depletion of the alkali reserve and the imminence of lethal irreversible changes in the central nervous system.

CHANGES IN THE TOTAL BASE OF THE BLOOD AND SHOCK IN DIABETIC COMA

In table 3 determinations of total base in the venous blood in 10 cases of diabetic coma are shown with the accompanying values for total acetone bodies, carbon dioxide content, sugar and serum protein. In comparison with the normal value of 155 milliequivalents per liter, every case with 1 exception shows a reduction in total base to levels varying from 135 to 146.8 milliequivalents. The blood specimen used for base determination of patient 51, a man aged 24, was drawn after he had received 4,000 cc. of isotonic solution of sodium chloride intravenously. This patient, together with patient 50, a youth aged 16 years, whose total base rose from 146.8 to 154.8 milliequivalents in two hours and forty minutes, indicate how rapidly restoration of blood base and disappearance of shock may occur if sufficient amounts of isotonic solution of sodium chloride are given during the first two hours of treatment.

TABLE 3.—*Reduction in Total Base of the Blood in Diabetic Coma*

Case No.	Total Base, M.Eq. Liter	Blood Carbon Dioxide, Vols. per Cent	Blood Total Acetone Bodies, Mg. per Cent	Blood Sugar, Mg. per Cent	Serum Protein, per Cent	Notes
42	135.6	17	...	308	7.1	
43	135.9	12	68	534	6.6	Death from purulent sinusitis
44	136.1	16	118	256	6.7	
45	139.3	9	195	720	9.0	
46	139.4	11	...	720	7.4	
47	139.6	18	120	350	8.7	
48	141.0	11	125	494	7.7	
49	144.6	9	60	320	6.7	
50	146.8	14	144	800	8.1	11:20 a.m.
50	144.4	..	162	...	8.0	12:55 p.m. same day
50	154.8	19	...	290	9.1	2:00 p.m.
51	103.0	7	195	1,232	5.5	Blood taken 3 hours after entry and after giving 4,000 cc. salt solution I.v.

The reduction in carbon dioxide content of the blood to values varying from 7 to 18 volumes per cent depends on the accumulation of ketones in the blood. In this series the values for total acetone bodies expressed as acetone varied from 60 to 195 mg. per hundred cubic centimeters. Dehydration is an important factor, but in this series of 10 patients only 3 show values for serum protein exceeding 8.0 per cent. These 3 cases (47, 45 and 50) had extreme ketosis, as shown by blood acetone values of 120, 144 and 195 mg. per hundred cubic centimeters, yet all recovered.

It is unfortunate that the changes within tissue cells, which necessarily depend on the surrounding extracellular fluid, are not accessible to chemical study. The diagrams of Guest[7] and Rapoport, reproduced by Gamble,[8] show the typical changes in the red blood cells during diabetic coma and recovery. A large reduction in base is consequent on the fall in base concentration in the plasma, that is, a reduction in sodium of the plasma brings about removal of potassium from the cells. This withdrawal of intracellular base in diabetic acidosis was shown by the increase in excretion of potassium in the urine described by Atchley and Loeb.[9] Increases in hydrogen ion concentration, changes in inorganic phosphate and diffusion of chloride ions into the cells illustrate a group of structural changes important in other tissue cells as well as the red corpuscles.

TABLE 4.—*Carbohydrate in Normal Human Tissues and in Diabetic Coma (Men Weighing 70 Kg.)*

	Normal		Diabetic Coma	
	Per Cent	Total, Gm.	Per Cent	Total, Gm.
30 Kg. muscle (glycogen)	0.6	180	0.3	90
1,800 Gm. liver (glycogen)	6.0	108	1.0	18
Skin (glucose)	0.08	4	0.56	28
21 Kg. extracellular fluids (glucose)	0.08	17	0.70	146
Total		309		282

The acute shock associated with burns or trauma has been shown by Rosenthal[10] in experimental studies to be relieved by sodium chloride solution given by mouth or by vein with higher rates of recovery than when plasma is given intravenously. Serum was slightly more effective when given orally than when given intravenously. The effect of serum was due to its electrolyte content rather than to its protein content. Dextrose solution was without effect. Apparently the sodium ion is of such specific importance that the state of shock may be regarded as due to tissue damage resulting from sodium deficiency. Clinical confirmation is afforded by the work of Fox,[11] using sodium lactate solutions given by mouth. These results again support the practice of giving isotonic solution of sodium chloride subcutaneously and by vein to coma patients in shock up to 10 or 15 per cent of body weight. Smaller amounts may be ineffective.

Treatment aimed at the heart is without value in our experience in uncomplicated diabetic coma, no matter what the blood pressure or pulse rate may be. The pulseless and anuric stage of the patient is due to dehydration and shock associated with the loss of water and electrolytes, of which sodium chloride is the most important.

SUPPLIES OF CARBOHYDRATE IN BODY TISSUES IN COMA

In table 4 are shown the approximate differences in carbohydrate content of the main tissues of a normal man and a man in diabetic coma, each weighing 70 Kg.

7. Guest, G. M.: Organic Phosphates of the Blood and Mineral Metabolism in Diabetic Acidosis, Am. J. Dis. Child **64**: 401 (Sept.) 1942.
8. Gamble, J. L.: Extracellular Fluid, Harvard Department of Pediatrics, 1942, chart 40.
9. Atchley, D. W., and others: On Diabetic Acidosis, J. Clin. Investigation **12**: 297, 1933.
10. Rosenthal, S. M.: Experimental Chemotherapy of Burns and Shock, Pub. Health Rep. **58**: 13, 39, 505 and 1429, 1943.
11. Fox, C. L., Jr.: Oral Sodium Lactate in Treatment of Burn Shock, J. A. M. A. **124**: 207 (Jan. 22) 1944.

In Cunningham's Anatomy, seventh edition, it is stated that 42 per cent of a man's weight is muscle. In 30 Kg. of normal muscle 180 Gm. of glycogen would be present, in contrast to 90 Gm. in the muscles during diabetic coma.

In diabetic coma Geelmuyden[12] found that the glycogen content of the liver varied from 0.96 to 3.03 per cent while the fat varied from 2.63 to 7.32 per cent. Bloor[13] points out that a reduction in the glycogen content of the liver is apt to be associated with an increase in fat content. The relationship is by no means consistent. Therefore, if the normal liver contains 108 Gm. of glycogen, in diabetic coma liver glycogen may be reduced to 18 Gm.

When the level of the blood sugar is raised to high levels the skin appears to be one tissue in which the excess sugar enters in large concentration, playing a role similar to the fields along the course of a river, which are flooded when the stream rises too high. Trimble and Carey[14] analyzed the skin and muscles of diabetic patients at the Deaconess Hospital and showed that similar concentrations of sugar in the skin followed changes in the sugar of the blood. An increase in the sugar of the muscles did occur, but it was not as great as the increase of sugar in the skin. In the diabetic patients, when the blood sugar varied in 5 patients from 213 to 345, the sugar in the skin varied from 177 to 222 mg. per hundred cubic centimeters in contrast with the average value of skin sugar in nondiabetic patients of 56 mg. As determined by Bischoff,[15] in one young woman and in one young man the weight of the integument amounted to 3.18 and 4.85 Kg. Assuming the concentration of glucose in the skin of a man weighing 70 Kg. with a blood sugar of 700 mg. would be roughly four fifths the concentration of the sugar in the blood, about 28 Gm. of glucose would be present in the skin, as against 4 Gm. in the normal skin.

Extracellular fluid including the blood plasma amounts to 30 per cent of body weight. The concentration of glucose in the extracellular fluid varies somewhat but in general parallels that of the blood. Venous blood sugar is stated as 80 mg. per hundred cubic centimeters, but it is known that arterial blood sugar is oftentimes higher by 5 to 20 or more milligrams per hundred cubic centimeters. It is true that the intraocular and cerebrospinal fluids contain glucose in somewhat lower concentration than the venous blood. It seems likely that with the great increase in the concentration of glucose in the extracellular fluid some increase in intracellular glucose must occur. Otherwise, harmful effects on the cell membrane might result. Another possibility in coma with excessive hyperglycemia is the occurrence of a high level within muscle or liver cells of glucose compounds or derivatives easily converted into glycogen by the action of insulin. In that case the amount of carbohydrate in the tissues in coma may well be equal to or even greater than that of the normal individual of equal weight.

The problem in treating diabetic coma is actually the problem of converting by the use of insulin a large amount of unused and unusable glucose present in the tissues of the body into glycogen and energy. The administration of glucose does not increase the oxidation of carbohydrate during coma (Root and Carpenter[16]). A sufficient supply of glucose is present in body fluids to make possible glycogen formation during the six to eight hours which may necessarily precede the resumption of the diabetic diet. In twenty-four hours of bed rest the caloric requirement of 1,500 calories may be satisfied by protein 70-75 Gm., fat 65-75 Gm. and carbohydrate 100-150 Gm.

12. Geelmuyden, H. C.: Fat Content of Blood and Liver in Diabetic Coma, Acta. med. Scandinav. **53**: 381, 1920.
13. Bloor, W. R.: Biochemistry of the Fatty Acids, New York, Reinhold Publishing Corporation, 1943, p. 295.
14. Trimble, H. C., and Carey, B. W., Jr.: On the True Sugar Content of the Skin and of Muscle in Diabetic and Nondiabetic Persons, J. Biol. Chem. **90**: 655, 1931.
15. Morris, H.: Morris' Human Anatomy, edited by J. P. Schaeffer, Philadelphia, Blakiston Company, 1943, p. 54.

LESSONS FROM CASES REPORTED BY OTHER PHYSICIANS

Requests within a year for advice, consultation or review of 14 cases of diabetic coma with fatal outcome brought us into contact with the results obtained when patients in diabetic coma have received glucose solution in large amounts intravenously or subcutaneously. The following cases are typical of the 14:

CASE 1.—A boy aged 12 years, admitted in coma with a blood sugar of 475 mg., received intravenously 1,000 cc. of 5 per cent glucose and 50 units of insulin at 4 p. m. From 6 till 10 p. m. he was given six injections of 50 units of insulin at intervals. From 11 p. m. till 6 a. m. he was given fourteen injections of 30 units at thirty minute intervals. During this same period he received 1,000 cc. of 10 per cent glucose solution intravenously and two intravenous infusions of Hartmann's lactate solution. Karo syrup was given by stomach tube until the child had received a total of 300 Gm. of glucose (including 150 Gm. as glucose solution by vein). His fluid intake was 5,675 cc. The urine never became sugar free; actone never disappeared from the urine in spite of the fact that he received 770 units of insulin. He died at the end of eighteen hours. Autopsy was negative. If the patient had been given no glucose intravenously or as Karo syrup by mouth but had received a moderate dose of perhaps 150 to 200 units of insulin immediately on admission, the result would have been a fall in blood sugar due to storage of the excess glucose as glycogen and the oxidation of sufficient quantity to replace and thus to reduce the excessive ketone formation from fat, with probable recovery.

CASE 2.—A girl aged 15 years entered another hospital in diabetic coma. The blood sugar was 400 mg. On admission, 600 cc. of urine was catheterized. One hour later another 400 cc. of urine was obtained. She was given 1,500 cc. of 5 per cent glucose solution not long after admission, and this was repeated three hours later. Anuria came on about one hour after admission and no urine was secreted during the remainder of her hospital stay. At the end of twelve hours the blood sugar was 667 mg. and the carbon dioxide combining power was 11 volumes per cent. At this time an attempt was being made to provoke urine secretion by the intravenous administration of 50 per cent glucose solution. This attempt naturally failed, and the child died at the end of eighteen hours with anuria. Autopsy was negative.

When coma is rapidly advancing, the administration of glucose solution intravenously does not produce diuresis and is often sufficient to tip the patient over into the stage of exhaustion and anuria, with fatal results.

HARMFULNESS OF GLUCOSE ADMINISTRATION IN DIABETIC ACIDOSIS

In the cases reported by Root and Carpenter, glucose solution given intravenously did not bring about any rise in respiratory quotient indicating any increase in glucose oxidation. When insulin is given in diabetic coma, the respiratory quotient will rise because some of the excess glucose present in the blood and tissue fluids is oxidized and some converted into glycogen. Administration of 50 or more grams of glucose in coma, as commonly practiced, is harmful because (1) no more than 5 to 10 Gm. of carbohydrate can be or need be oxidized per hour in order to check ketone formation, (2)

16. Root, H. R., and Carpenter, T. M.: The Effect of Glucose Administration in Diabetic Acidosis, Am. J. M. Sc. **206**: 234, 1943.

glucose neutralizes the action of insulin, (3) a rise in blood sugar is produced which makes it difficult to determine the required insulin dosage, (4) such excessive hyperglycemia is harmful to the pancreas, (5) excessive glucose concentration in the blood and tissues under the condition of acidosis will result in anuria and (6) the experiments of Astwood, Flynn and Krayer [17] show that excessive glucose damages the liver.

DIAGNOSIS AND TREATMENT OF DIABETIC COMA

1. *Diagnosis.*—Patients suspected of having diabetic coma belong in the hospital. Diagnosis is often difficult, especially if the degree of acidosis and coma do not correspond. In table 5 a brief summary of the clinical and chemical features of 5 recent cases is given.

2. *Preparation Prior to Hospital Admission.*—Transfer of the patient should be carried out early rather than late as an emergency measure. The hospital should be one in which laboratory service is available day and night, including holidays and Sundays. At the Deaconess Hospital a wartime diabetic coma emergency service has been organized through the cooperation of the staff and the hospital authorities. The objects of this wartime diabetic coma service are to (1) keep available a bed for a coma case, (2) provide special diabetic nurses, (3) guarantee laboratory analyses of the blood and

TABLE 5.—*Differential Diagnosis in Comatose Patients*

	Unconscious	Respiration	Blood Sugar	Blood Acetone Bodies, Mg.	Pulse	Blood CO_2, Vols.
Diabetic coma	+	Air hunger	High	100	Rapid	15
Brain tumor (no diabetes)	+	Slow	Normal	0	Slow	60
Meningitis and diabetic acidosis	+	Slow	High	50	Rapid	30
Gastric hemorrhage and diabetes	+	Rapid	High	0	Rapid	60
Alkalosis due to vomiting and alkalis) and diabetic acidosis	+	Rapid	High	75	Rapid	76

urine at any time and (4) offer consultative service to any doctor in the vicinity who has a coma case.

3. *Insulin.*—When it is learned by phone that a patient is to be brought to the hospital, a preliminary dose of 20-60 units of insulin is given by the home physician or by the family, provided the diagnosis seems probable. At the hospital the following preparations are made: The bed is made ready with blankets and hot water bottles, and apparatus is assembled for the giving of salt solution subcutaneously and intravenously and for the carrying out of gastric lavage and giving of an enema. On arrival the patient is put in bed well covered with a blanket and surrounded by hot water bottles placed outside the blanket, so that burns of the skin will not occur. A blood specimen and urine specimen are immediately obtained for analyses for blood sugar, carbon dioxide, nonprotein nitrogen and blood chloride. An extra box is kept on hand so that venous bloods can be withdrawn and kept under oil.

The immediate problem concerns the amount of insulin to be given in the first two hours. Two facts make the decision difficult: (*a*) resistance to insulin increases rapidly as acidosis advances and (*b*) the law of diminishing returns applies to the efficiency of insulin, so that the expected result from the second and succeeding 50 units may be obtained only by greatly increasing the dose. A striking relation exists between the level of blood sugar and the total amount of insulin required in the first twenty-four hours of treatment to bring about improvement. In table 6 it is seen that in 2 adults whose blood sugars were 1,380 and 1,540 mg. the

TABLE 6.—*Blood Sugar Level Correlated with Insulin Dose in 123 Coma Cases*

Blood Sugar Level on Admission, Mg. per 100 Cc.	Number	Average Insulin Requirement During First 24 Hours
1,200-1,600	2	1,224
1,000-1,200	15	815
600-1,000	26	387
400- 600	29	250
200- 400	51	162

average insulin requirement in the first twenty-four hours was 1,224 units. The decline in insulin requirement parallels the blood sugar level. Indeed, in 51 cases out of the 123 cases in which the blood sugar level was between 200 and 400 mg. the average insulin requirement was only 162 units. It should be noted that, among patients whose blood sugar levels were less than 400 mg. on admission, in many instances some insulin had been given prior to admission by telephone order. All other measures, such as provision of warmth, fluid and salt intake, have an important place, but no question is so important as the decision regarding the total number of units of crystalline insulin to be given in the first hour of treatment. Many a patient in diabetic coma receives plenty of insulin but, owing to delays or indecision in the first two or three hours, too little insulin is given at the time when it will count the most. Insulin given six hours after admission in an unconscious patient is probably worth unit per unit less than one-third what it is worth during the first hour after admission. The average adult, drowsy and with a blood pressure over 100 mm., would receive 50 to 100 units. A child with diabetes recently discovered might need 20 to 40 units as an initial dose. However, in patients profoundly unconscious, in shock and dehydrated usually 100 units should be given subcutaneously and 50 or more units given intravenously. A second dose would probably be given one-half hour later. By the end of an hour some of the laboratory reports will be available, and with blood sugar values more than 600 mg., especially if the patient is in shock and is a patient with diabetes of long duration, we would usually expect 200 to 300 units to be administered in the first hour. The fundamental principle in the use of insulin is to give enough insulin to obtain the pharmacologic effect; namely, utilization of the excess glucose present

TABLE 7.—*Schedule for Administration of Insulin*

Benedict reaction	Red	Orange	Yellow	Yellow-Green	Green	Blue
Insulin (units required)	24	20	16	8	0	0

in body fluid, deposition of glycogen and cessation of excessive ketone formation. The most reliable evidence that this change in metabolism has taken place is the decline in blood sugar level. Urine and blood tests should be done at least once in two hours, and the insulin dosage may be planned in the average case in which an adequate dose has been received during the first few hours of treatment, in accordance with the schedule presented in table 7. As the patient's condi-

17. Astwood, E. B.; Flynn, J. M., and Krayer, O.: Effect of Continuous Intravenous Infusion of Glucose in Normal Dogs, J. Clin. Investigation **21**: 621, 1942.

tion improves, the interval for the collection of specimens and giving of insulin may be increased to three, four or six hours. During this period the clinical condition of the patient, including particularly the mental state, type of breathing and the pulse, will help in deciding the plan of administration of insulin. However, no plan of treatment based on mathematical calculations of the blood sugar and carbon dioxide will take the place of constant bedside observation of the patient and adjustment of treatment to that patient's changing condition.

4. *Fluids and Salts.*—Dehydration, hemoconcentration, falling blood pressure and reduced peripheral blood flow with consequent cold, purplish extremities, dryness of the skin and softness of the eyeballs are the distinguishing features of severe diabetic coma. This shock syndrome seems to depend chiefly on the loss of sodium and water consequent on insulin deficiency and acidosis. Sunderman [18] found that administration of insulin to the diabetic human being causes transfer of water and electrolytes from the serum into the tissues. Therefore in treating diabetic acidosis the administration of hot broths and saline solution early in acidosis and in liberal amount is of fundamental importance but not sufficient without insulin. Ordinarily, to unconscious patients with low blood pressure we would give simultaneously 1,500 cc. of salt solution intravenously and 1,500 cc. subcutaneously within a few minutes after admission into the hospital. This may need to be repeated one or more times within the next few hours of treatment. In patients with anuria a safe rule is to leave the needle in the vein of the arm or the ankle and let salt solution flow continuously 1 liter per hour until blood pressure rises and urinary secretion begins, provided it has been shown that the anuria is due to the ketosis and shock and not to some complication. Actually, in 2 cases reported by Root and Riseman [19] anuria was relieved only when 13,800 cc. and 11,600 cc. of salt solution were given parenterally during the first twenty-nine hours of treatment. Fifty cc. of 10 per cent salt solution may be given intravenously when anuria is accompanied by a reduction in plasma chloride. The average patient will need from 4 to 7 liters of fluid within the first twenty-four hours. Enemas, not only once but repeatedly, may be necessary. The giving of fluid by mouth is limited to 100 cc. per hour only after the stomach has been washed out.

5. *Transfusion with Whole Blood or Plasma.*—Actually there has been no loss of blood protein or plasma in diabetic coma. Hemoconcentration is due to dehydration. The effective agents in diabetic coma, namely insulin, water and salt, are effective because they replace definite deficiencies. Actually there seems to be no good practical or theoretical reason for believing that plasma or whole blood is needed or can very often be of use in the uncomplicated case of diabetic coma.

6. *Gastric Lavage.*—Rarely should a patient in true diabetic coma be treated without drainage of the stomach and lavage with warm water within the first hour after admission. Usually the stomach is dilated and distended with a large amount of fluid containing food remains that are colored black because of bleeding from the stretched gastric mucosa. A pulse rate of 240 has been known to fall to 150 within fifteen minutes after a distended stomach was washed out. A large Ewald tube is usually more effective than a small duodenal tube.

7. *Enemas.*—A cleansing enema should be given and in severe cases repeated during the first few hours of treatment.

8. *Food.*—It is our plan to begin the administration of food within four to six hours after admission, provided the patient has no complication which would prevent it, and provided sufficient insulin has been given promptly to have brought about clinical improvement. The administration of food is given hourly, 3 to 4 ounces, including warm broth, salted liquid and thin gruel or tea with a little sugar. Some patients will take a similar amount of orange juice or ginger ale. Carbohydrate 10 Gm. per hour and a total of 30 to 50 Gm. each of protein and fat usually are the upper limits during the first twenty-four to thirty-six hours. The use of intravenous dextrose solution during the first hours of treatment is contraindicated. After a sufficient amount of insulin has been given, if the patient cannot be fed by mouth, then from six to twelve hours later intravenous injection of glucose solution can be used as a means of providing food.

9. *Alkalis.*—No justification for the use of alkali is found in the record of our last 123 cases, in which only two deaths occurred. If alkalis have been used, the blood carbon dioxide value may be dangerously misleading. It is extremely important to remember that the patient in diabetic coma may still die of coma even though the carbon dioxide of the blood is raised to normal by the administration of alkalis.

10. *Stimulants.*—Patients unconscious for several hours with evidences of peripheral circulatory failure, low blood pressure, rapid weak pulse and cold mottled extremities may be given, in addition to the treatment already recommended, caffeine, epinephrine, ephedrine or transfusion. The benefits observed seem to be temporary and slight.

11. *Prevention of Diabetic Coma.*—As with some other diseases, methods aimed at the prevention of coma may accomplish more than its treatment. A patient should be taught practical and simple methods for prevention, and particularly what actions should be taken in the early stages. A patient must know how to test the urine and must realize that frequent testing of the urine at home at daily intervals should result in prompt action and medical advice when the tests show that the diabetes is not under proper control. He must know how to give his insulin dose accurately and well. He must know how to weigh and measure food and substitute one food for another. A series of simple rules should be taught to all diabetic patients no matter how mild their condition seems in its early stage. They should be in close contact with their physician in order that at intervals more careful estimates of the diabetic control may be made and in order that patients may have the advantage of new features of treatment.

SUMMARY

1. In a series of 478 cases of coma observed from May 1923 to August 1940 the mortality was 12 per cent. When the insulin given in the first three hours of treatment was increased from 83 units in 1923-1927 to an average of 216 units among 123 consecutive cases treated between August 1940 and May 1, 1944 the mortality was only 1.6 per cent.

2. Diabetic coma is an emergency due to acute insulin deficiency requiring administration of adequate, often large doses of insulin in the first three hours.

18. Sunderman, F. W.: The Water and Electrolyte Distribution in Diabetes Mellitus, Am. J. M. Sc. **205**: 102, 1943.
19. Root, H. F., and Riseman, J. E. F.: Exceptional Requirement of Insulin and Salt Solution in Diabetic Coma, J. A. M. A. **116**: 1730 (May 21) 1938.

3. Estimation of the insulin requirement is difficult because (*a*) insulin resistance increases hourly with acidosis and (*b*) the law of diminishing returns applies to insulin.

4. Treatment should be carried out in a hospital.

5. Important aids in treatment are (*a*) use of isotonic solution of sodium chloride intravenously or subcutaneously administered, 4,000 cc., or, when necessary to overcome shock and impending anuria, up to 10 per cent or even 15 per cent of body weight, and (*b*) gastric lavage.

6. The harmful effect of glucose administration may be concealed in early diabetic coma by the insulin simultaneously administered; the moderate case of coma may be converted into a severe one requiring excessive insulin dosage. In advanced coma glucose administration either by mouth or by needle may cause anuria and death.

81 Bay State Road.

ABSTRACT OF DISCUSSION

DR. EDWARD S. DILLON, Philadelphia: Dr. Root has considered briefly most of the important therapeutic agents used in the treatment of diabetic acidosis. Of these, much the most important is insulin. He has emphasized the giving of large doses early, and with this I am in entire accord. The attending physician by the end of four hours can approximate from the chemical examinations of the blood and the clinical condition of the patient what the total insulin requirements are and realize that most of the insulin should be given within four hours and not strung out in small doses for many hours. During the first five months of this year, 15 patients with diabetic acidosis have been admitted to my service at the Philadelphia General Hospital, all of whom recovered. The average amount of insulin given was 251 units, of which 183 units was given within the first four hours. The average blood sugar on admission was 596 and the average carbon dioxide 14. The average carbon dioxide at ten and one-half hours was 51. The second important matter which Dr. Root has considered is the use of glucose. When the blood sugar on admission is above 400 there is plenty of glucose present for a vigorous carbohydrate combustion if adequate insulin is given, and there is no need of giving glucose during the early hours of treatment. The giving of glucose early seriously interferes with estimating the total insulin requirement, as all blood sugar determinations, except the one on admission, are unpredictably influenced by the glucose. However, we do use glucose, introduced by a nasal tube, in the early hours if the admission blood sugar is below 400, or in later hours if the blood sugar is falling rapidly, in order to keep out of hypoglycemia. All patients with diabetic acidosis are dehydrated. There has been severe loss of sodium and also chloride. These losses must be made up by the administration of isotonic solution of sodium chloride. Our patients usually received 1,500 to 3,000 cc. subcutaneously. I should not recommend the large amounts of isotonic solution of sodium chloride intravenously which have been suggested by Dr. Root. Large amounts of saline solution in the circulation may precipitate the syndrome of shock, not cure it. The plasma proteins are usually of normal concentration, but the total blood volume is reduced, and the total proteins are reduced. Saline solution reduces the plasma protein concentration, and the blood volume cannot be maintained. Something must be given which will stay in the circulation and maintain blood volume, and the obvious answer is plasma.

DR. ROLLIN T. WOODYATT, Chicago: I agree with Dr. Root that the prime essential in the treatment of a patient with diabetic coma is to give a decisive dose of insulin. If you do that, it really does not make too much difference what else you do. In my own clinic we manage by six hour periods. If we have a patient showing definite symptoms of acid intoxication we start with what we think will be an adequate dose. A patient weighing 60 Kg. will be given 60 to 120 units at once. This will be repeated three hours later and again at the end of the period. Dr. Root has suggested that once in a while you may run into a patient with insulin resistance and that it might be well to double those doses against such a contingency, which I think is a point well taken. Certainly it would do no harm. In the first six hours of management of a patient with serious symptoms of acid intoxication there is no possibility of an insulin reaction. In the second period, if the patient was not deeply in when he entered, there would be a possibility, but as long as you keep sugar running through into the urine you cannot have an insulin reaction, and if in the second period the respiration has come down, the nausea has cleared and the ferric chloride reaction in the urine has become negative, you can then give 50 to 100 Gm. of orange juice or an equivalent at one hour intervals and gradually come down from period to period with the insulin dose. But as long as glycosuria and ketosis are still present the maximum doses should be sustained. I cannot too strongly endorse what has been said by the other two speakers as to the fallacy of administering glucose in the early periods of management when ketosis is present and the body is already overloaded with sugar. There never was any sound theoretical basis for that procedure. It is no new idea and there has never been any sound clinical support for it. Second in importance to the giving of adequate doses of insulin and keeping them up steadily until the patient is out of the woods is the restoration of the water balance. In our own experiments with intravenous injections of glucose and salt to produce artificial dehydration we have found that between normal hydration and extreme dehydration there may be a difference of 5 per cent or less in the body weight. And it is not necessary to restore all of the water that has been lost to annul the symptoms of clinical dehydration. It is our practice to give patients of average weight a liter of water, usually in the form of isotonic solution of sodium chloride each six hour period for the first twenty-four hours, and when that is done the tongue will be moist, the urine will be copious and the thirst allayed in the first twelve hours, as a general rule. I concur with the second speaker that 7 or 8 liters of fluid in a diabetic coma case is abnormal, unnecessary and undesirable. The giving of such quantities in general practice must lead to edemas, and it is cabable of causing circulatory failure.

DR. SAMUEL SOSKIN, Chicago: To say that I maintain that sugar is more important than insulin in the treatment of diabetic coma is a misquotation and a misinterpretation. The prime need of the comatose patient is for insulin, and the first and most important thing to do is to administer adequate dosage of it. But granting the importance of insulin does not mean that carbohydrate is harmful. Dr. Root naturally sees mistreated cases when he is called in consultation by doctors who have got into trouble. It is true that they were given sugar, but the mistreatment consisted not in what they were given but in what they failed to get, namely adequate insulin and sodium. Why blame the carbohydrate? A fairer comparison with his own patients would be with a group treated by competent physicians or clinics, who have received sugar as well as adequate amounts of insulin and sodium. I am well aware of the fact that many cases of coma can be treated successfully with insulin alone. But the import of Dr. Root's statistics depends on what he calls diabetic coma. How deep was the coma? How long were the patients in coma before treatment was begun? Aside from carbohydrate administration, in what respects were the cases which he saw with other physicians treated less adequately than his own? No comparison is possible unless these questions are answered. As regards the amount of carbohydrate needed by a patient in coma, Dr. Root's calculations completely ignore the carbohydrate utilized in the first twenty-four hours, as the patient's metabolism reverts to normal under the influence of the administered insulin. Taking this into account, I have calculated that the comatose patient requires about 500 Gm. of carbohydrate in the first twenty-four hours and about 250 Gm. per day thereafter. With a low carbohydrate intake, 1 unit of insulin will be "equivalent" to 1 or 2 Gm. of carbohydrate, while on a high carbohydrate intake 1 unit of insulin may be "equivalent" to as much as 10 Gm. of carbohydrate. Dr. Root's neglect of this fact is similar to that of the chemist

who seeks to speed up a reaction by adding a catalyst but forgets that the rate of reaction is proportionate to the concentration of the substrate. In the treatment of coma I agree wholeheartedly that the most important and the first thing to do is to give insulin. But once this is done there are a number of other things which should be done in order to treat not just the coma but the whole patient. One of these is the restoration of fluids to counteract dehydration and hemoconcentration. Another, especially when the kidneys are in difficulty because of the lack of sodium, is to administer salt or alkali. And certainly still another is the administration of the carbohydrate which the patient needs for his metabolism and to restore his glycogen reserves.

DR. FREDERICK M. ALLEN, New York: It is difficult to condense into a few words my general agreement with Dr. Root and Dr. Joslin regarding the ideal of strict control of diabetic sugar, together with some doubts concerning the positive conclusions on acidosis. These clinical results are admirable and unequaled, but clinical statistics may not always establish general theories. One illustration is the amputation mortality cited in some of these meetings. Is the New York surgeon with 6 or 7 per cent mortality five or ten times as good in his methods as his colleague with five or ten times that death rate, and is Boston with a 3.6 per cent mortality twice as good as New York's best? Our hospital has more deaths than that from cardiac complications alone. Yet we feel sure that our 15 per cent of deaths under refrigeration demonstrates a real improvement and that refrigeration might save some of the few desperate cases included in the mortality elsewhere and ease convalescence for the others. Since I was long ago authoritatively prevented from continuing diabetic experimentation, I can only ask a series of questions about acidosis. Is every diabetic coma in man or dog curable at every stage? Is there a terminal stage of shock, as I formerly suggested, which is fatal in spite of clearing up of sugar acetone and without any fault of the physician's method? As to coma being due solely and invariably to lack of insulin, what about the fatal ketosis of normal fasting puppies and the coma produced in the preinsulin era by suddenly withdrawing carbohydrate from certain diabetic patients? Does excess of glucose in any degree inactivate insulin, reduce carbohydrate utilization or increase fat metabolism? Is not the opposite more credible? Theoretically, I doubt that glucose would increase mortality. During the brief clinical crisis of coma, physicians without immediate laboratory facilities may be bolder with huge insulin doses if they are assured against hypoglycemia by moderate glucose injections. Granting intelligent administration without excesses, is glucose by vein necessarily more harmful than the carbohydrate which Dr. Root very properly feeds as soon as possible?

DR. HOWARD F. ROOT, Boston: I wonder if Dr. Allen has read the case of Grunberg and Rhodes. Their boy, admitted in early coma, was given glucose, with the result that in the next twelve hours he became moribund and the blood sugar tested every few hours reached the level of 1,600 mg. The total insulin requirement rose to 1,600 units. Patients who are totally unconscious are certainly in a more serious condition than coma patients who have not yet reached that stage. Yet even this classification may be deceptive. A child with relatively little ketosis may be unconscious because of an accompanying infection. A patient with rapidly advancing acidosis may walk and respond to questions, yet after recovery he remembers neither the gastric lavage nor any other details of his treatment. The administration of glucose may neutralize the effect of insulin in coma and therefore greatly increase the amount required. It is common knowledge that, when hypoglycemia has been caused by an overdose of insulin, glucose neutralizes the effect of insulin. Dr. Soskin would force on a critical coma case in twenty-four hours 500 Gm. of glucose. I doubt that many men in treating diabetic patients who are on their feet and doing their daily work would urge on them 500 Gm. of glucose a day. I would prefer that we enable him to utilize the extra glucose circulating in his body fluid by administering insulin and then as he recovers begin to feed him. Figures for the utilization of carbohydrate in terms of grams per unit of insulin are entirely unreliable during diabetic coma because of increasing insulin resistance.

ALCOHOLISM

A SOCIAL DISEASE

D. B. ROTMAN, M.D.
Director of the Psychiatric Institute of the Municipal Court
CHICAGO

At times of maximum stress and strain, such as is the present, we can expect big things to happen. No one doubts that the psychologic tensions released by World War I made possible the introduction in this country of modified prohibition in 1919, which in turn paved the way for the absolutisms of the Volstead Act in 1920. Many argue that, because the bad tastes of that era still linger on, that which did happen once, and so disastrously for all, could not possibly happen again. Yet it is the opinion of the Research Council on Problems of Alcohol of the American Association for the Advancement of Science that there are now indications of another drift toward prohibition.[1] Prohibition may or may not be lurking around the corner, but one need not be labeled an alarmist to insist that the problems of alcoholism were never more acute or pressing to this nation, mobilized as it is in both its manhood and its womanhood for total warfare. Any statistical statement concerning the size of this problem cannot help but be an understatement. It is easy enough to tabulate the worst chronic alcoholic addicts, especially those in the lower economic brackets, who gravitate to the courts and the state hospitals, but the more vexing aspects of the problem occur in the groups who have social and economic prestige and remain therefore statistically sequestered. H. W. Haggard's and E. M. Jellinek's suggested figure of 600,000 pathologic drinkers against a drop curtain of 40,000,000 users of alcohol is certainly a conservative estimate at least as to the number of problem drinkers.

As every acute and chronic alcoholic addict is actually a sick person, the treatment of alcoholism naturally becomes a major medical problem. As alcoholic indulgence ultimately affects in turn all of the vital organs, including the central nervous system, medical scrutiny has disclosed a wide range of clinical manifestations which in their aggregate have come to be known as "the alcoholic diseases." These diseases, either alone or in combination, set up such formidable medical problems as to tax the ingenuity of the general practitioner and his various consultants. Great progress has been made concerning the true etiology of these alcoholic diseases, particularly the role that the vitamins play in their causation. It is certainly a feather in the cap of the neuropathologist that he has been able to establish conclusively that the involvement of the peripheral nervous system by alcohol is a neuropathy (a degenerative process due to the absence of essential vitamins) and not a bona fide neuritis (an inflammatory reaction in the nervous system set up by the presence of the alcohol). Such findings have practical value in that the use of certain specific vitamins has come to play an important role in the prophylaxis and therapeusis of these diseases. But in our enthusiasms for the vitamin approach let us not forget that this type of treatment is capable of combating only the organic complications of alcoholism. Obviously they cannot alter, or even touch, its primary and essential aspects. The

1. Research Council on Problems of Alcohol, Quart. J. Stud. on Alcohol 2: 431-451 (Sept.) 1941.

vitamin panacea has conjured up nowhere a more treacherous mirage than in the alcoholic sector.

There are many definitions for alcoholism; one is as good as another. For our purposes any individual who exhibits a strong psychologic affinity for any one or more of the many alcoholic products, coupled with an inordinate physiologic vulnerability of his body tissue to them, may be considered an alcoholic addict.

It is the latter half of this definition, dealing with the tissue vulnerability, that made it necessary to call on the medical and allied disciplines for possible solution. It is to these alterations in the body tissues that those of the biologic sciences have directed their major research. Appreciating their limitations, medical men have in turn been forced to call on others than biologists with a hope that a better understanding of the psychologic antecedents may be disclosed.

The psychologic aspects of the problem, as they gradually emerge, have become more and more intriguing. Research aiming at the delineation of a unitary alcoholic personality has up to date led all of us into a cul-de-sac. Efforts to squeeze the alcoholic addict into the established categories of personalities have been futile. Many have thought that because of the periodicity in the drinking of some alcoholic addicts (dipsomaniacs), and also because in many families epilepsy and alcoholism seem to be genetically linked, alcoholism must be epileptoid in character. However, according to Lennox,[2] electroencephalographic studies seem to refute such a concept. The epileptic and half of their near relatives demonstrate a characteristic dysrhythmia in their brain waves. No such findings have been demonstrated in the case of the alcoholic addict and his family. Definite conclusions along this line are to be held in reserve as yet. Lennox [2] conservatively states that this phase of the problem is ripe for further investigation. Phyllis Wittman,[3] using the Humm-Wadsworth temperament scale, compared a group of chronic alcoholic addicts with a control group. She found no outstanding epileptoid traits in the experimental group, 68 per cent of whom gave a definite history of periodic drinking.

Because of the surface affability of many alcoholic addicts and because of the "slap you on the back tendency" of most of those who are acutely intoxicated, some investigators had been inclined to believe that alcoholic addicts are cyclothymic (of extrovert tendencies). The majority of the students of the problem who have dug deeper have come up quite definitely with the schizoid (introvert) answer. Strecker [4] sums this all up: "Contrary to the general and lay public opinion, the alcoholic is not so likely to be a hail fellow well met; the alcoholic is apt to be preponderantly introvert." Billig and Sullivan,[5] in a Rorschach study of 40 alcoholic addicts, point out the basic introvert component present in a high degree even in a subgroup whose excellent adjustment seems to be attributable to extrovert relationships. This introvert tendency in an alcoholic addict has a strong prognostic influence and is found in many of the cases that prove refractory to treatment. This is easily seen in the notorious example of the "solo drinker" and in all alcoholic addicts who prefer to indulge stealthily and in privacy.

In general, the Rorschach test, that *pièce de résistance* of the modern clinical psychologist's armamentarium, emerges out of the alcoholic confusion in a state of virtual stalemate. Klopfer and Kelley,[6] authoritative American exponents of this test, are rather laconic and not too informative as they state "In general chronic alcoholics show no typical Rorschach pattern except that most chronic alcoholics yield Rorschach records which deviate considerably from the so-called normal."

As is to be expected, the psychoanalysts have stuck their tentacles into the problem. Their research has undoubtedly helped to illuminate, in some degree, the subterranean passages wherein lurk the conflicts from which the sufferer may be presumed to be seeking release through the narcosis of alcoholism. Schilder [7] is responsible for a neatly turned epigram which he credits to Simmel, to wit, "Alcohol dissolves the superego (the individual's personal and social consciousness)." This is indeed a nice phrase, but any one who has witnessed the physical and mental tortures brought to light in the phenomenon known as the "morning after hangover," wherein the superego is reprecipitated with such a catastrophic vengeance, could hardly take stock in the epigram.

Naturally the sex angle has been brought into the limelight by the analysts. Those who are addicted to the use of alcohol, according to them, are persons of immature sexual development. The analyst's slant is most properly epitomized in these arbitrary words credited to Abraham by Lewis: [8] "Every alcoholic bout is tinged with homosexuality." The clinical confirmation of this alleged latent homosexuality seems to come from the observation that by far the greater number of male alcoholic indulgence is done in male company. Lewis [9] nails this and a similar observation by Tausk to the mast thus: "Apparently this was written to the world not yet acquainted with our postprohibition excesses in women, where mixed drinking parties are the rule rather than the exception." At any rate, until the analysis can come forth with a broad cultural and educational program capable of whipping the inherent defect in the alcoholic addict's libido into more proper social channels or can furnish us with enough therapists to treat the individual alcoholic addict their pronouncements must be regarded as a species of name calling.

While discussing sex it is interesting to note some facts concerning the ratio of male and female alcoholic addicts. Myerson [10] states that the ratio of female to male alcoholic addicts is 1:7 or 1:8. Jellinek [11] places it at 1:6. Both of these writers attribute this ratio to the strictures of our social mores, which attempt to hold women down. In Switzerland the ratio is said to be 1:12, in Norway 1:23 and in England 1:2. Columns 5 and 7 of the accompanying table and the

2. Lennox, W. G.: Alcohol and Epilepsy, Quart. J. Stud. on Alcohol **2**: 1-11 (June) 1941.
3. Wittman, Phyllis: A Controlled Study of the Developmental and Personality Characteristics of Chronic Alcoholics, Collect. & Contrib. Papers, Elgin State Hosp. **3**: 77-84, 1939; A Differential Analysis of "Adjustment" Scores for Chronic Alcoholics and Controls, ibid. **3**: 85-93, 1939; Diagnosis and Analysis of Temperament for Group of Alcoholics Compared with Controls, ibid. **3**: 94-99, 1939.
4. Strecker, E. A.: Chronic Alcoholism: A Psychological Survey, Quart. J. Stud. on Alcohol **2**: 12-17 (June) 1941.
5. Billig, O., and Sullivan, D. J.: Personality Structure and Prognosis of Alcoholic Addiction: A Rorschach Study, Quart. J. Stud. on Alcohol. **3**: 554-573 (March) 1943.
6. Klopfer, B., and Kelley, D. M.: The Rorschach Technique, New York, World Book Company, 1942, p. 399.
7. Schilder, P.: Psychogenesis of Alcoholism, Quart. J. Stud. on Alcohol **2**: 277-292 (Sept.) 1941.
8. Lewis, N. D. C.: Personality Factors in Alcoholic Addiction, Quart. J. Stud. on Alcohol **1**: 21-44 (June) 1940.
9. Lewis: Personality Factors in Alcoholic Addition, p. 33.
10. Myerson, A.: Alcohol: A Study of Social Ambivalence, Quart. J. Stud. on Alcohol **1**: 13-20 (June) 1940.
11. Jellinek, E. M.: Outline of Basic Policies for a Research Program on Problems of Alcohol, Quart. J. Stud. on Alcohol **3**: 103-124 (June) 1942.

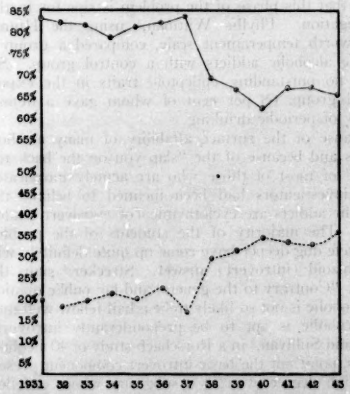
accompanying graph represent the ratio of male and female alcoholic addicts through a span of thirteen years, 1931 to 1943 inclusive, as studied in the Psychiatric Institute of the Municipal Court of Chicago. These show a change of ratio of 1:4½ or 5 in 1931 to 1:2 in 1943. Does this changed ratio indicate the deleterious by-product of the social movement known as feminism, which has reached its peak in the varied war activities and responsibilities of women? In passing it may be noted that this 1:2 ratio approximates that of England. In fairness it must be noted that this represents a sex ratio in only extremely pathologic cases.

Male and Female Alcoholic Addicts

Year	Total New Cases	Alcoholic		Male		Female	
		Number	Percentage	Number	Percentage	Number	Percentage
1931	1,423	169	11.64	130	88.3	39	18.7
1932	2,038	225	11.04	186	82.7	39	17.3
1933	1,925	449	23.32	363	82.0	86	18.0
1934	1,936	497	25.67	395	79.5	102	20.5
1935	2,022	428	21.16	357	81.1	71	18.9
1936	2,188	638	29.32	498	82.1	140	21.9
1937	2,352	620	26.36	521	84.1	99	15.9
1938	2,274	624	27.74	439	69.0	194	31.0
1939	2,100	644	29.29	433	67.3	211	32.7
1940	2,079	623	29.96	395	63.4	228	36.6
1941	2,638	739	28.01	510	69.1	229	30.9
1942	2,725	749	27.49	521	69.6	228	30.4
1943	2,670	615	23.00	416	67.8	199	32.2
Totals	28,464	7,011	24.60	5,136	73.4	1,875	26.6

Much has been written about the sadism-masochism elements of the problem. It is my belief that frequently an alcoholic situation arises out of a sadistic-masochistic imbalance. Clinical observation leads me to believe that the most constant phenomenon in the entire alcoholic picture is the symbiotic relationship between a person addicted to alcohol and a nearby person of an extremely masochistic makeup. In this secondary shadow individual the submissive and masochistic elements in the personality structure are so hypertrophied as to merit the descriptive phrase "a doormat personality." This doormat personality hovers over the alcoholic addict in the dual capacity of a foil and a cushion. To the male alcoholic addict the doormat personality often is an aged and widowed mother, a spinster sister or a wife. To the female alcoholic addict the doormat personality is frequently a second or a third husband or a common law husband or a paramour acquired in her descent down the ladder of deterioration. Unfortunately we are now seeing this mechanism working to the disadvantage of the overseas soldier, whose allotment to the delinquent wife and mother at home is used by her as an opening wedge into a novitiate of a chronic alcoholic career. Once this relationship to the doormat personality is solidified, not much in the way of reversal of the situation can be expected.

Prior to the war we had all come to a critical pass with regard to drinking and automobile accidents as well as to drinking and industrial mishaps. An underlying neurosis seeking release of tension through alcoholism seemed to be the link in these allied phenomena. When we removed the mask of alcoholism, under which accident proneness was parading, frequently there stood revealed the underlying neurosis. Because of the seriousness of automobile accidents the safety of the highways demanded that highly punitive legislative steps be instituted. These legislative acts were climaxed by the introduction into court procedure of the drunkometer and similar instruments purposing to gage the degree of intoxication registered in the alcoholic contents of the breath, the urine or the blood of the driver. The introduction of these percentages into the court record bid fair for a time to break the ancient dictum of the law that no person should be asked to testify against himself even though the testimony should be mute and chemical. It is true that the court finally held that such evidence was inadmissible, but the courts did hold that the fact that the driver refused submission to such a test could be introduced against him. These punitive upsurges were undoubtedly halted by the war emergency and the slacking speed rate prompted by genuine patriotism on the part of the motorists. This respite has given the experimental psychologist leisure time scientifically to check up on the influence of alcohol on the human psyche. Out of all the material these simple facts may be noted as being true: (1) Alcohol releases a mild euphoria, (2) there is a clouding of judgment, (3) there is some disturbance of muscular coordination, (4) there is a definite slowing down of choice reaction time. Jellinek and McFarland [12] state that "critical analysis of the total evidence of psychological investigations of experimental intoxication reveal that alcohol has a depressing effect on all psychological functions yet measured and that such stimulation as has been reported in some psychological variables is a pseudostimulation. The initial shortening of simple reaction time after alcohol turned out to be artefacts of averaging. The stimulation of muscular strength by alcohol does not seem to be the physiological effect to the absorbed alcohol. The concentration of will power after alcohol is limited to intermittent will activity only; the evidence points toward an impairment of volition in continuous tasks." If all of this is true, what are we to expect in the postwar period, which promises to deluge us with machines, gadgets and push buttons of the sort which will in turn ordain the very minutiae of our living?



Relative percentage of male (solid line) and female (broken line) alcoholic addicts, 1931-1943.

12. Jellinek, E. M., and McFarland, R. A.: Psychological Experiments on Effects of Alcohol, Quart. J. Stud. on Alcohol 1: 272-371 (Sept.) 1940.

Whatever alcoholism is or is not, its universality makes it something of the people, and its partial solutions can very properly be expected to come from the people. What other explanation do we have of the phenomenal growth of the Alcoholics Anonymous? This organization in a short period of ten years has embraced over 12,000 ex-alcoholic addicts. Although we must agree with its leaders in giving religion the most of the credit for the success of this movement, I think we must look deeper if we are to understand its real worth. Those of us who have repeatedly witnessed the failure of the purely religious approach, that is the alcoholic addict's pledge to his clergyman, and the failure of treatment of alcoholic addicts in secular institutions, must indeed be skeptical as to the efficacy of the purely religious program. Truly, Alcoholics Anonymous has used religion, but what it has actually done is to implement the best principles of modern mental hygiene simultaneously. Its approach has been entirely positive. Heretofore, we of the profession have treated the alcoholic addict by constantly keeping before him the mirror of his present and ultimate degradation. This was obviously a negative attack. Alcoholics Anonymous courageously reverses this process by pointing out that good citizenship and social decency can be arrived at and sustained by ex-alcoholic addicts. Who are the mentors of the Alcoholics Anonymous movement? They are not Olympiads. Indeed, they are of the common clay of sinners and sufferers: the ex-alcoholic addicts themselves. It is not tenable for these tutors to explain to their pupils how it is possible to refrain from drinking if the mentors do not continue to refrain themselves. By this maneuver a solid foundation to the movement is already set up. It may also be that the doctors and the therapeutists have been too stern in their attitude toward the alcoholic addicts and have driven them to the bosoms of their fellow alcoholic addicts. This stentorian stand of our profession can be said to be best embodied in the words of Strecker:[13] "The skilled therapist is strictly impersonal, objective and unemotional and from the very beginning must decline to deal with anything but the mature segment of the personality of his patients, no matter how minute that segment may happen to be." By thus refusing him a narcissistic bargain the therapist in many instances succeeds only in alienating the alcoholic addict from his therapist.

Group psychotherapy is all the vogue today. Its rationale and efficacy was never better demonstrated than in this mass movement known as Alcoholics Anonymous. Alcoholics Anonymous is dynamic and its potentialities for healthy contagion are limitless. It has the spread power of the chain letter. By its extreme efforts to arrive at nondenominationalism it has evolved a naive and beatific level of thinking in which the Deity is pictured as an energy source. The profile of that deity is flexible to meet any individual's need. Borrowing heavily from William James, Alcoholics Anonymous has agreed that the acceptance of this energy source need not be immediate or spontaneous or even emotional. By so doing Alcoholics Anonymous has eliminated the pyrotechnics and pitfalls usually attendant on the sawdust trail type of conversion. Above all it has eliminated the devil from its scheme of things. Any one who has seen a case of alcoholic hallucinosis and has seen the look of terror in the eyes of persons suffering from the effects of alcohol squirming under the fancied machinations of the devil and his cohorts can appreciate the subtle therapeutic shift of this simple deletion.

What the Alcoholics Anonymous movement needs is a closer cooperation with the medical profession, and what the medical profession needs even more is a closer cooperation with Alcoholics Anonymous. As time goes on the Alcoholics Anonymous movement could stand for a more rigorous bookkeeping system in its credit and debit ledger, i. e. of its successes and failures. It must cultivate a stronger capacity for autocritcism if it is to steer clear of an unrealistic optimism which could easily cause the movement to disintegrate into a species of Couéism.

In 1932, two years before the movement was crystallized, Meyer[14] anticipated such a mass effort in the following words: "A great share of the work, therefore, lies in a better understanding of the social as well as individual resources of satisfaction for the patient. Much of this work of adjustment is carried on upon a strongly individualizing basis; but even then, in the end, there will always be persons who do best when treated in groups, with the help of a sense of belonging, and being accepted, and of sharing the common convictions, whether they be religious or some kind of mystery, and an open treatment turning to the facts as found, and as they are, either under an intimate patient-physician relationship or a more socialized and open survey and utilization of assets and recognition of specific difficulties."

Can the doctor alone solve the problem of alcoholism? The answer is definitely no! More and more because of the many aspects in the problem, which I have only attempted to highlight, we must come to the inexorable conclusion that alcoholism is a social disease and that at best the doctor can be busy with only a segment of the problem. As a corollary to this conclusion we must not allow the doctor to become pessimistic of his role. Indeed it should spur him on to added effort. The medical man has an excellent precedent for a broadening of his vista regarding alcoholism. Only when we ceased looking on venereal diseases as venereal diseases per se and began to look on them as social diseases did we as doctors make real progress in the venereal problems. Working under this large canopy does not mean that we lose our identity as doctors. The greatest advances in specific chemotherapy as far as venereal diseases are concerned have come recently when we have acknowledged the total situation. It is only when we as doctors begin to see the whole problem that we can make our maximum contribution. We cannot but agree with the forthright and frank statement of Carlson,[15] who honestly says "As I see it it is too complex for the biological and medical disciplines." The proper approach to the problem is exemplified in the pioneering efforts of the Yale projects of the Research Council on Problems of Alcoholism, wherein all facets of the problem are under scientific investigation and wherein particular stress is placed on the biologic, psychologic, sociologic, anthropologic and religious aspects. To these efforts the American medical profession should lend its best support.

1121 South State Street.

13. Strecker: Chronic Alcoholism, p. 15.

14. Meyer, Adolf: Alcohol as a Psychiatric Problem, in Emerson, H., and others: Alcohol and Man: The Effects of Alcohol on Man in Health and Disease, New York, Macmillan Company, 1932, pp. 299 and 300.

15. Carlson, A. J.: The Alcohol Problem: Possible Lines of Useful Research, Quart. J. Stud. on Alcohol 2: 672-676 (March) 1942.

BENIGN SURGICAL LESIONS OF THE RIGHT COLON

CURTICE ROSSER, M.D.
DALLAS, TEXAS

Although only one fifth of colonic cancers are found in the right colon, the ileocecal coil is the location of the majority of those inflammatory pseudotumors of the abdomen which require surgical treatment. For many years, however, the overwhelming preponderance of lesions originating from infection of the vermiform appendix and its sequelae so overshadowed all others as to prevent the recognition of a variety of rarer pathologic involvements of the terminal ileum and cecum which are now beginning to be identified, classified and differentiated.

Fig. 1.—Thickened, constricted bowel, in tuberculoma of cecum, resembling annular cancer.

Since W. J. Mayo [1] in 1888 reported cases in which perityphlitis gave rise to palpable tumors which were difficult to differentiate from malignant swellings, numerous studies have appeared in the literature. Walters and Synhorst [2] aptly termed this condition a "ligneous" infection of the cecum, as it is the woody, firm tumor which confuses the diagnostic picture. Other inflammatory tumefacients, however, must be considered in the differential diagnosis of surgical conditions of this area, chief among which are tuberculoma, simple ulcer of the cecum, the cecal extensions of regional ileitis and nonspecific granuloma of the colon.

My intent in the present discussion is to illustrate these briefly by examples recently encountered.

Hypertrophic Tuberculosis.—This condition of the intestine, restricted chiefly to the cecum, was first described by Henri Hartman of Paris in 1891. It is frequently a primary lesion. The tissue change is characterized by cellular infiltration and excessive fibrosis, with consequent thickening of the wall and constriction of the lumen. The symptoms are local tenderness and pain, occasional bleeding, flatulence and indigestion. If the disease involves a limited area of the large bowel, complete resection is indicated. In the following example it will be observed that the cecal lesion was preceded by a tuberculous anal ulcer and apparently arrested phthisis:

C. A., a white man aged 46, first presented himself in 1941 when a tuberculous anal ulcer was excised with subsequent healing. A fibrous tuberculosis of the left lung was discovered at that time. The patient was seen again in August 1943 with discomfort on the right side and across the lower part of the abdomen periodically for two years and, for six months, occassional fresh blood in the stools. His sputum was negative for tubercle bacilli on repeated examinations. A roentgenogram of the chest demonstrated that the lesion of the left lung was unchanged. A palpable mass was found in the right lower quadrant, and a colon film disclosed an obstructive lesion in the cecum which resembled cancer (fig. 1). The Kline test was negative, and the red cell count was 5,000,000. The preoperative diagnosis, hyperplastic tuberculosis of cecum, was based chiefly on the collateral findings and the blood count. At exploration the cecum was thick and pearly gray with narrowed lumen; scattered tubercles were seen on the last 3 inches of the ileum (fig. 2). An ileocolostomy was done and resection of the right colon was performed twelve days later. The pathologic examination revealed fibrous thickening of the cecal wall and a mucosa replaced by granulation tissue with areas of cellular infiltration and caseation; giant cells were found surrounding these tubercles.

Simple Ulcer of the Cecum.—This was first described a century ago by Cruveilhier.[3] While he stated that the condition could occur anywhere in the colon, the great majority of cases which have been reported have been in the cecum, on the mesial side near the valve. The cause is unknown; the diagnosis in no instance has been made before celiotomy or autopsy, and every patient not operated on has died. While less than 50 cases have been reported in the literature, it is probable that numerous unreported or unrecognized instances of this disease have occurred.

Early collected reports of nonspecific colon ulcers attempted the correlation of lesions from all portions of the bowel, including instances of multiple ulceration. Because the cecal ulcers suggest a definite clinical entity more clearly than lesions in the left colon and because the latter may presumably have been the result of ulcerative colitis and other disease processes partial to the left colon, the pathologist now tends to segregate the single, nonspecific, penetrating ulcer of the right colon as more nearly answering the essential criteria for a pathologic entity.[4]

From the Section on Proctology, Southwestern Medical Foundation College of Medicine, Dallas, Texas.

Read before the Section on Gastroenterology and Proctology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 15, 1944.

Original illustrations are the work of Lewis Waters, Ph.G., P.D., Associate Professor, Department of Medical Art, Southwestern Medical Foundation Medical College.

1. Mayo, W. J.: Inflammations Involving the Cecum, Its Appendix, or Both, Tr. Minnesota State M. Soc., 1888, p. 63.

2. Walters, W., and Synhorst, A. P.: Ligneous Infection of Cecum, Resulting from Subacute Appendicitis, S. Clin. North America **6**: 1203 (Oct.) 1926.

3. Cruveilhier, J.: Rectum in Atlas d'anatomie et pathologie, 1830-1832.

4. Rosser, Curtice: Simple Penetrating Ulcer of the Cecum, Ann. Surg. **119**: 377 (March) 1944.

The condition is encountered in both sexes at varying ages and may first present itself in an acute fulminating phase in which rapid perforation is common. In this stage the symptoms resemble those of acute appendicitis with pain, nausea, tenderness and low grade temperature. The usual preoperative diagnosis under these circumstances has been appendicitis. Closure of the ulcer, in the acute stage, is effectual. A second group of cecal ulcers is seen after the condition has become chronic—often after partial perforation has occurred. The presence of tumefaction, constipation, occasional blood in the stool, vague discomfort in the lower part of the abdomen and a filling defect in the cecum has resulted, in the reported chronic cases, in an almost universal preoperative diagnosis of cancer. In the chronic stage, resection of the cecum is usually necessary. In the following case partial perforation had apparently occurred before the patient was first seen:

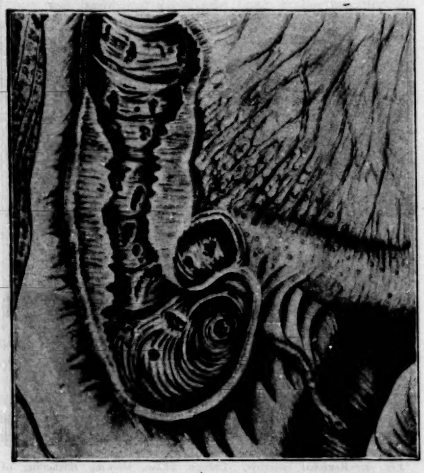


Fig. 2.—Tuberculoma of cecum: Artist's drawing, showing fibrous thickening of cecal wall, superficial ulceration and tubercle formation of mucosa, with tubercles on nearby ileum.

S. W., a white woman aged 65, stated when she was examined that she had observed for some months a cramping pain in her abdomen, especially in the right lower quadrant; slight nausea was present, but the bowel habit was unchanged. A roentgenogram demonstrated a filling defect in the cecum and there was an increase in the leukocyte count, but the erythrocytes were normal in number. A mass was palpated in the right lower quadrant.

At exploration, under the preoperative diagnosis of "cancer of the cecum," the cecum was found to be enlarged, indurated and surrounded by omental adhesions and an ileocolostomy was done.

After a brief period the abdomen was again entered in January 1943, the preliminary diagnosis being "tumor of the cecum." Some free fluid was found; the conditions otherwise were unchanged. The right colon was resected at this time. The patient had a rather stormy convalescence, associated with irregular temperature. Pathologic examination revealed a firm ulcerated area (fig. 3) in the cecum 2.5 cm. from the base of the appendix. The wall of the cecum was thickened and the peritoneum of the terminal ileum was thick and rough. Microscopically it was seen that the ulcer extended through all the layers of the cecum, its base consisting of granular tissue infiltrated with leukocytes with scattered round cell infiltration in the adjacent tissue. No evidence of any specific etiologic agent was found. Sections of the ileum revealed normal mucosa with infiltration of the serosa and submucosa with lymphoid cells. One lymph node was examined and revealed hyperplasia of the reticuloendothelial elements. The pathologist's diagnosis was simple ulcer of the cecum with partial perforation and subacute pericecitis and peri-ileitis.

Regional Ileitis.—This is a granulomatous proliferative process of chronic inflammatory nature which, by preference, begins at the ileocecal valve and extends upward along the terminal part of the ileum; direct extension to the cecum and ascending colon occurs frequently, which is in part responsible for the suggestion that "regional enteritis" is a better name for the lesion. Its symptom complex is characterized by pain in the right lower quadrant of the abdomen, diarrhea, fever, occasional obstructive phenomena and the formation of fistulous tracts to nearby viscera or the abdominal wall. Young men are commonly afflicted, the average age, according to Crohn,[5] being 27.6 years.

In the acute form the bowel is red and swollen, with adherence to the omentum and adjacent peritoneum and is associated with soft, enlarged mesenteric lymph nodes. When the chronic phase is reached, the patient has lost appetite and weight and has a chronic incomplete obstruction and not infrequently a palpable mass which consists of gray, soggy, edematous, adherent terminal ileum and cecum.

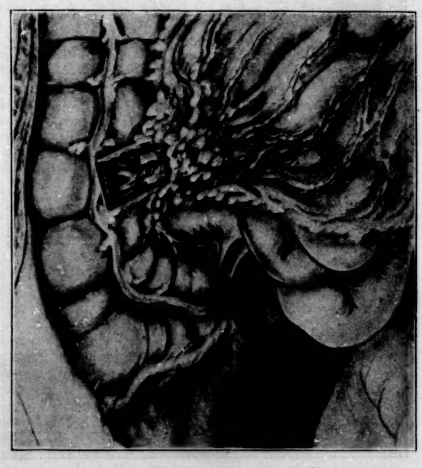


Fig. 3.—Simple penetrating ulcer of the cecum. The window demonstrates the area and type of ulceration; the thickened wall and the attachment of the omentum is also shown.

The treatment is surgical and consists in radical removal of the portion of the bowel involved. Lahey[6]

5. Crohn, B. B.; Ginzburg, L., and Oppenheimer, G.: Regional Ileitis: Pathologic and Clinical Entity, J. A. M. A. **99**: 1323 (Oct. 15) 1932.

6. Lahey, F. H., and Sanderson, E.: Lesions of the Right Colon Involving Right Colectomy, J. A. M. A. **120**: 1356 (Dec. 26) 1942.

has suggested that this may be done in one stage if, as is often the case, the abdomen has been entered recently and in the process of appendectomy a protective vaccination accomplished.

In the following case the pathologic process was observed in its acute phase at the time a preliminary anastomosis was done, and six weeks later, when the abdomen was entered for resection of the involved bowel, the lesion was seen to have become chronic:

P. C. P., a white man aged 28, had a history of chronic ulcerative colitis of the left colon with recurrence over a prolonged period. This condition had recently been brought under control. Six weeks before operation, however, diarrhea recurred, associated with intermittent fever and pain in the right lower quadrant. Roentgen examination of the bowel disclosed a contracted terminal ileum. No definite mass could be palpated. In June 1943 the abdomen was entered and an ileotransverse colostomy performed. The last 8 inches of the ileum, the ileocecal valve and the first 2 inches of the cecum were seen to be thick, red and corrugated and a number of soft glands were palpated in the mesentery (fig. 4).

Following the anastomosis the patient continued to manifest increased temperature, complain of right abdominal pain over a palpable tumor and to lose weight. A fistula developed in the wound. In August the terminal ileum and right colon were resected. At this time the involved bowel was found to be gray, very thick and soggy in appearance, with a very narrow lumen (fig. 5). Examination of the tissue revealed that the specimen consisted of the right colon and 38 cm. of the terminal ileum. The surface of the cecum was smooth, glistening and grayish pink to dark red; its wall was thick and firm. The appendix was found to be firmly adherent to the cecal wall, and there was pronounced thickening in the region of the ileocecal valve,

Fig. 4.—Regional enteritis: Acute phase, showing swelling of the terminal ileum and cecum, with corrugation of the surface and enlarged soft mesenteric glands.

the lumen being considerably constricted in this region. The mucosa was smooth, glistening and grayish pink. Rugae were present and no ulcerations were noted. The wall of the ileum was much thickened, varying from 2 to 3 cm. The mucosa was smooth, glistening and grayish red. There were multiple superficial ulcerations with several polypoid-like projections into the lumen and also multiple yellowish white, granular appearing areas on the surface. In between the areas of ulceration there were cordlike elevated areas in the mucosa. There were multiple enlarged glands throughout the attached mesentery. Microscopically the mucosa consisted of straight tubular glands, which in many areas were completely surrounded by thick massive

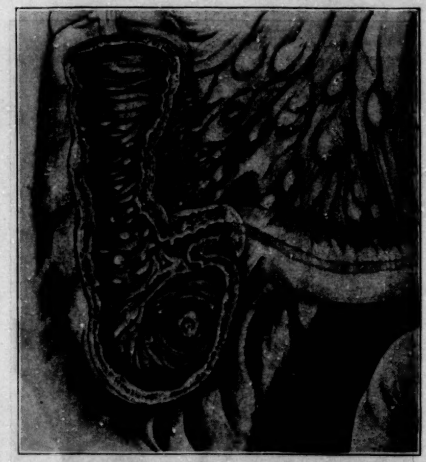


Fig. 5.—Regional enteritis: Chronic phase, showing thickening of wall of cecum and terminal ileum. Extreme constriction of lumen of small bowel, erosion and ulceration of mucous membrane.

infiltrations of polymorphonuclear neutrophilic leukocytes, eosinophils, plasma cells, macrophages and lymphoid cells. These tubular glands were composed of simple columnar cells, most of which were of the goblet type. The ducts of these glands and their crypts were filled with mucus. In many areas there was necrosis of the mucous membrane with ulceration. The ulceration in some of the sections extended through the corium and into the submucosa. In the areas where the mucous membrane remained intact there was increased vascularity, and the submucosa likewise showed pronounced infiltration with the cells enumerated. The aggregate lymph follicles of the ileum were almost entirely destroyed and replaced either by masses of eosinophils, polymorphonuclear neutrophilic leukocytes, lymphoid cells, macrophages or adipose tissue. In the areas of the submucosa where polymorphonuclear infiltration was not so massive there was increased proliferation of the fibrous connective tissue. The muscular layers also showed diffuse cellular infiltration and fibrous tissue proliferation which resulted in a thickening of the muscular walls. Section of one of the lymph nodes showed the caspsule and architecture of the node to be intact, but there was definite proliferation of the centers. The pathologic diagnosis was regional ileitis, cecitis and colitis. The patient died eighteen days after the resection from a pulmonary embolus.

Objection has been raised[7] to separating from this granulomatous, progressively extending and migrating disease involving the bowel wall a rarer group of massive, localized, nonspecific neoplasms which occur in the colon and in other portions of the bowel, but Crohn[8] believes that, although the etiologic agent may well be the same, the gross appearance, anatomic loca-

7. Wilensky, A. O.: Essential Nature of Nonspecific Granulomatous Lesions of the Gastrointestinal Tract, Surgery 6: 288 (Aug.), 452 (Sept.) 1939.

8. Crohn, B. B.: Personal communication to the author in May 1942.

tion and dissimilar method of growth and extension warrant their separate consideration.

Moynihan[9] in 1906 described six inflammatory tumors of the large intestine which, before exploration, he confidently expected to be cancers and differentiated these tumors from tuberculosis. In 1908 Mayo-Robson[9] described 11 such cases, some found in the cecum and large intestine, and later Braun[9] added 3 instances of granulomas of the splenic flexure to the previous experience.

Localized nonspecific granulomas of this type, while of unknown origin and while presenting a microscopic picture somewhat resembling regional enteritis, do not cause diarrhea, stricture and fistulous tracts; they tend to increase in size while remaining at one area in the bowel. I encountered a neoplasm of this type two months ago in a man aged 74 who for one year had noticed constipation, flatulence, indigestion and cramping in the lower abdomen and who, on examination, was found to be anemic and underweight and to have a firm palpable tumor in the right lower quadrant of the abdomen. When the right colon was removed by the Lahey technic, the tumor so resembled an adenocarcinoma, because of its texture, indurated surface and absence of change in the adjacent bowel (fig. 6) that the pathologist's report was the first intimation that the lesion was benign.

It is difficult to suggest a clearcut diagnostic differentiation between cancer and these inflammatory conditions because of such common factors as tumefaction, similar roentgenographic appearance and chronicity.

Fig. 6.—Nonspecific granuloma of cecum, encountered in white man aged 74. Terminal ileum and remainder of cecum are normal.

All of the latter, however, are usually associated with some temperature elevation and with increased leukocyte count; anemia is not pronounced, and the tumor is usually more sensitive. It is perhaps quite fortunate that surgical intervention is indicated in each of these conditions, because if a patient has received the extended and adequate preparation now considered essential in large bowel surgery before the abdomen is entered, any discrepancy in the preoperative diagnosis can be safely corrected and the proper procedure instituted at the time of surgery.

710 Medical Arts Building.

9. Cited by Wilensky.[3]

ABSTRACT OF DISCUSSION

DR. WALTER A. FANSLER, Minneapolis: The largest single series of cases of solitary ulcer reported is 15, and in none of those was the correct diagnosis made. Of those 15 cases there was a diagnosis of appendicitis in 6, peritonitis in 2, intussusception in 1 and carcinoma of the cecum in 1. Ten of the cases had perforated at the time of operation. There were 9 deaths, 5 were cured and 1 result was not stated. In 4 of the 5 recoveries, perforation had not occurred. I can add 1 case to this group: A woman aged 47, whose first complaint was a hemorrhage from the rectum with numerous dark clots seven months preceding examination, observed no more blood until two days previous to examination. Proctoscopy was negative except for some dark digested blood in the rectum. There was no history of diarrhea. Her temperature was normal, and, as far as could be found from the family physician, she had not had any elevation of temperature. Hemoglobin was 11.7 Gm., or 71 per cent, erythrocytes numbered 3,400,000, the white blood cell count was 7,200 and the differential count was normal. A hard mass about the size of a golf ball could be felt in the region of the cecum. This was freely movable and was not tender. My diagnosis was probable carcinoma of the cecum, and the roentgenologist agreed. A double barreled ileocolostomy was done as described by Lahey. On opening the bowel I found a sluggish cratered ulcer. The walls surrounding the crater were approximately 1.5 cm. thick, gradually thinning out toward the periphery of the induration. It had a gross appearance of a chronic ulcer one sometimes sees in the stomach. The microscopic examination showed chronic inflammatory changes with leukocytic infiltrations which extended down to the serosal surface. The patient made an uneventful recovery. The point I wish to make in this discussion is that in ulcer of this type there is no possible method of making a differential diagnosis between this condition and carcinoma of the cecum. Therefore the possibility of this condition should be kept in mind in preoperative conversation with patients.

St. Jerome and Vitamin A.—The following passage, taken from St. Jerome's "Life of St. Hilarion," which was written about A. D. 392, appears to be the earliest account of the etiology, symptoms and cure of severe vitamin A deficiency: "From his thirty-first to his thirty-fifth year he had for food 6 ounces of barley bread, and vegetables slightly cooked without oil. But finding that his eyes were growing dim and that his whole body was shriveled with an eruption and a sort of stony roughness (impetigine et pumicea quadam scabredine) he added oil to his former food and up to the sixty-third year of his life followed this temperate course, tasting neither fruit nor pulse, nor anything whatsoever besides." This combination of an eye affection, nightblindness or perhaps xerophthalmia, with a severe hyperkeratosis precisely resembles the condition described by Frazier and Hu (*Arch. Dermat. & Syph.* **33**:825, 1936) as occurring in Chinese patients who had received a diet not unlike that of St. Hilarion, namely a cereal other than wheat, white cabbage and salted vegetables. These patients were speedily cured by cod liver oil or carotene; and it seems probable that crude and unpurified olive oil, such as St. Hilarion would have permitted himself, would contain enough of the fairly high vitamin A content of the olive to relieve his symptoms and maintain good health. The evident accuracy of St. Jerome in this particular may induce further study of this interesting biography.—Taylor, F. Sherwood: St. Jerome and Vitamin A, *Nature*, Dec. 23, 1944, page 802.

THE INFLUENCE OF GYNECOLOGIC DISORDERS ON THE URINARY SYSTEM

J. MASON HUNDLEY JR., M.D.
AND
WILLIAM K. DIEHL, M.D.
BALTIMORE

As can be readily understood, the presentation of such a comprehensive topic requires the elimination of many of the self-evident phases which are so well covered in the various gynecologic textbooks. For a number of years we at the Hospital of the University of Maryland have been greatly interested in the various changes in the urinary system, particularly those due to pelvic and obstetric conditions. With us, female urology is a division of gynecology, for by this union we feel that the gynecologist is singularly fitted for the evaluation and treatment of urologic problems occurring in women. One of the most important factors in the treatment of any urinary lesion is a careful preliminary pelvic examination in order to rule out the presence of gynecologic disorders which may be evidenced only by urinary manifestations. It is not uncommon for a patient with frequency and dysuria to have the bladder and trigone treated while the causative factor is a moderate sized myoma on the anterior uterine wall.

The subject will be discussed in relation to the three most important etiologic factors. The first and probably the most outstanding is the changes produced by pressure. Several years ago we published an article on the physiologic changes occurring in the urinary tract during pregnancy,[1] and, as the changes in the urinary system associated with the developing pregnant uterus are so frequent and so typical, a brief review of this work will be of value, for lessons here learned also apply to other etiologic factors which are of a pathologic nature.

For many years it has been known that dilatation changes occur in the urinary tract during pregnancy, but it was not until the development of intravenous urography that we have been aware of its nearly constant occurrence. In our urographic study of 27 normal pregnant women throughout the succeeding months of gestation and the puerperium, the most constant change noted was a dilatation of the pelvis and calices of one or both kidneys, a dilatation, tortuosity and kinking of one or both ureters, and a lateral displacement of these structures. In addition, there was an apparent atony of the ureteral musculature observed. Every patient showed some deviation from the normal, the right kidney and ureter being more affected than the left. The dilatation of the ureter always began at the pelvic brim and in not 1 of the patients studied was there found a definite and significant dilatation of the pelvic portion of this structure. With the advance of pregnancy the dilatation of the upper urinary tract gradually increased to the time of delivery, and following this event there was a rather rapid regression to the normal state, taking place as a rule in twenty-eight days. It is a well known fact that the presence of frank infection greatly retards this normal involution process. In this urographic study it was found that with the progressive dilatation of ureter and pelvis there was an associated retardation of the excretion time of the kidney, so that a delay of thirty to forty-five minutes was necessary before a satisfactory film could be obtained. Associated with this delayed excretion time there develops an apparent increasing atony of the ureteral musculature. We believe that dilatation of the ureter is produced by two factors; first, changes in the ureter due to hormonal stimulation, as shown by muscular hypertrophy, increased vascularity and loss of tone. This changed, succulent tube is then subjected to the pressure of the semicystic, pregnant uterus at the pelvic brim, with resulting dilatation. We feel that if the primary hormonal changes had not taken place the soft, vascular uterus could not exert sufficient pressure on the dense wall of the ureter to produce dilatation. From microscopic studies we have previously shown that the ureter during pregnancy undergoes rather constant and typical changes. One of the most striking of these is the pronounced muscular hypertrophy of the sheath of Waldeyer, i. e. the outer longitudinal layer of musculature which invests the lower 3 to 6 cm. of the pelvic ureters. There is also seen muscular hypertrophy throughout the length of the ureter, confined for the most part to the circular layer. The ureter becomes vascular, soft, dilated and ribbon-like. The opinion has been advanced that this hypertrophied sheath of Waldeyer

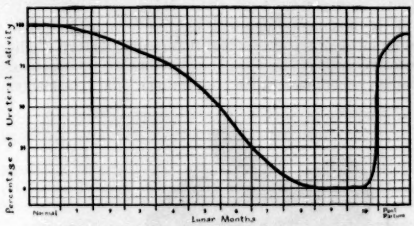


Fig. 1.—Peristaltic changes throughout pregnancy.

is the important causative factor in dilatation of the ureter. If this is correct, the dilatations should be bilateral and should begin at the bladder. Our findings have not supported this view, for, as already stated, the changes always begin at the pelvic brim and the right ureter is much more affected than is the left. This increased incidence of right ureteral involvement is due to dextrorotation of the uterus, to cushioning of the left ureter at the pelvic brim by the overlying sigmoid and also to the fact that the right ureter crosses the pelvic brim nearly at a right angle, making it more vulnerable to pressure. The course of the left ureter is much more of a straight line and is consequently less subject to pressure effects. We believe that the vast majority of investigators are now of the opinion that dilatation of the ureter at the pelvic brim is due to pressure, this being the concept originally promulgated by Opitz in 1905. We feel that this theory was definitely proved by the experiments we conducted with the use of the indwelling catheter during the later stages of pregnancy. It was shown that if continuous drainage of the upper urinary tract with the indwelling catheter was maintained for forty-eight to seventy-two hours there was a definite regression of the dilated pelvis and abdominal ureter.

Is there sufficient evidence to support our views that the urinary tract is subject to hormonal stimulation? We feel that the following data do support this opinion, which is of scientific as well as of clinical interest.

Read before the joint meeting of the Section on Obstetrics and Gynecology and the Section on Urology at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 16, 1944.

1. Hundley, J. M., Jr., and others: Am. J. Obst. & Gynec. **30**: 625, 1935.

When one considers the embryologic development of the generative and urinary systems, the two arising from the same anlage, it does not seem too hypothetical to believe that the hormonal influences elaborated during gestation could affect the two systems in the same manner. As already mentioned, one of the most outstanding evidences of hormonal activation of the urinary tract is that of the pronounced hypertrophy of the musculature throughout the ureter and especially in its lower end, namely the sheath of Waldeyer. This cannot be considered a work hypertrophy, for we found these same hypertrophic changes in a patient dying following an operation for an ectopic pregnancy of seven weeks' duration, when it was impossible to have pressure because of the small size of the uterus. Other evidence to support this hormonal theory is presented by the autopsy findings of a man dying from a teratoma of the testicle with generalized metastasis, which proved to be a chorionepithelioma. Prior to operation the urine had been strongly positive for anterior pituitary-like substance on two occasions. The examination of the ureter showed definite hypertrophic changes throughout the entire organ but was most evident in the juxtavesical portion. Here there was tremendous hypertrophy of the sheath of Waldeyer, the greatest external diameter measuring 8 mm., the measurement of the normal nonpregnant ureter in the same location being about 3.5 mm. Another factor that seems to support the endocrine theory of ureteral activation is that following delivery, and with the rapid decrease of the hormonal content of the urine due to the absence of the placenta, the main source of estrogenic and anterior pituitary-like substances there is a progressive and rather rapid regression of the urinary tract to its normal state. Knowing of the work of Traut and McLane on ureteral peristalsis during pregnancy, we wished to confirm if possible their observations, for we felt that the peristaltic variations they noted might be dependent on hormonal influences and not on muscular work fatigue, as might be supposed. If we could demonstrate that these variations were due to hormonal influences we would then have additional confirmatory data to support this hormonal theory as an etiologic factor in ureteral changes. We found, as they did, that there is an increasing atony of the ureter with advancing pregnancy and that beginning with the end of the second trimester there is a complete loss of tone, with absence of peristalsis. There is a return of peristalsis just prior to parturition, which then continues on through and after the puerperium. Figure 1, a composite graph, depicts the peristaltic changes throughout pregnancy.

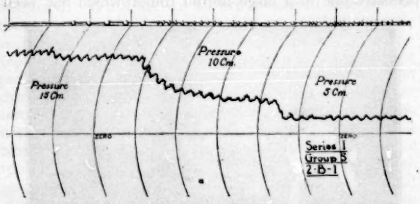


Fig. 2.—Base line tracing before treatment with diethylstilbestrol.

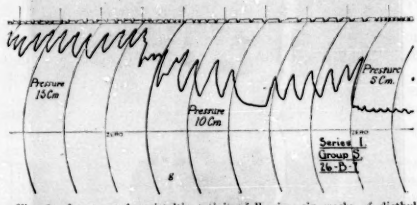


Fig. 3.—Increase of peristaltic activity following six weeks of diethylstilbestrol therapy.

In order to carry out these experiments on ureteral peristalsis, Trattner's hydrophorograph was used. The details of the procedure are given in the original article.[2] After completing this study of ureteral behavior during pregnancy and observing the very striking atonia that developed, we then attempted to prove that the peristaltic activity and atony were dependent on hormonal influences. We know that during pregnancy large amounts of estrogenic and progestogenic substances are elaborated in the placenta. The estrogenic substance produces growth and also causes contraction of the uterus, whereas it is generally thought that the progestogenic substance allays uterine activity. By priming normal women with large and prolonged doses of estrogenic and progestogenic substances we hoped to simulate in a measure hormonal conditions that exist during pregnancy and possibly produce the same ureteral behavior that normally occurs during this period. A brief summary of the experimental results follows: Eight normal women were treated with diethylstilbestrol, each receiving orally 2 mg. twice daily over a period averaging ten weeks, the patient thus receiving a total of 280 mg. Weekly hydrophorographic tracings were made and there was noted a great increase in peristaltic activity as shown by the great increase in amplitude of the contraction waves. For comparison see figure 2, a base line tracing before treatment with diethylstilbestrol, this being the usual pattern for the normal woman.

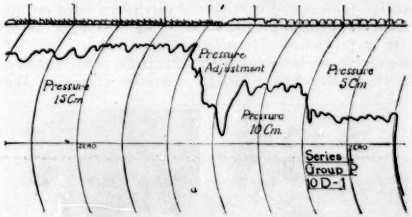


Fig. 4.—Base line tracing prior to progestogenic therapy.

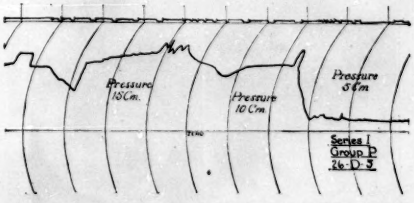


Fig. 5.—Absence of peristaltic waves following six weeks of progestogenic therapy.

2. Hundley, J. M., Jr.; Diehl, W. K., and Diggs, E. S.: Am. J. Obst. & Gynec. 44:858, 1942, from which figures 1, 2, 3, 4, 5 and 6 in the present article are taken, through the courtesy of the American Journal of Obstetrics and Gynecology.

Now compare this with the tracing obtained after six weeks of treatment with diethylstilbestrol (fig. 3). Here is seen a great increase of peristaltic activity.

In order to determine whether allaying of ureteral activity and final atonia developed under the influence of a progestogenic substance, another group of 8 normal women was selected. These women received an intensive course of progestogenic therapy over a period of nine weeks, each receiving weekly proluton 8 mg. intramuscularly and in addition pranone 280 mg. orally, making a total dosage that each received, proluton 72 mg. and pranone 2,520 mg. No symptoms referable to this intensive therapy were demonstrable. Weekly hydrophorographic tracings were made, and there was noted a gradual decrease in the amplitude of the peristaltic waves until complete atonia existed. For comparison see the normal pattern of ureteral activity before progestogenic therapy was begun (fig. 4). Now compare this with the tracing obtained after five weeks of intensive therapy and there will be noted complete atonia, this effect being similar to that observed in the pregnant woman of thirty weeks' gestation (fig. 5). It would seem from these two experiments that hormonal influences play a definite role in ureteral behavior, the estrogenic substance activating the peristaltic contractions and the progestogenic substance allaying these contraction waves.

EFFECTS OF UTERINE AND OVARIAN TUMORS ON URINARY SYSTEM

We have briefly presented the physiologic changes that occur in the urinary tract during pregnancy as well as demonstrating the hormonal influences on this system. Now we wish to consider what effects uterine and ovarian tumors and parametrial carcinoma have on the urinary system.

In a previous publication we reported a group of urographic studies associated with large pelvic tumors, showing preoperative and postoperative changes. We

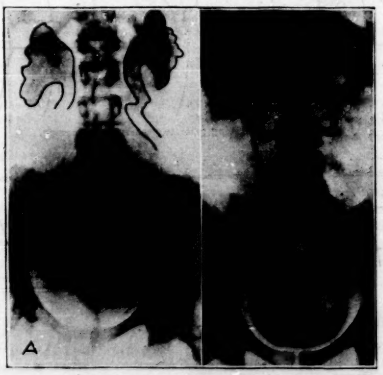


Fig. 6.—Urograms showing (*A*) pressure effects due to large fibroid tumor and (*B*) regressive changes thirty-eight days after operation.

were able to demonstrate that definite pressure effects, as evidenced by dilatation of the upper urinary tract, were produced when the pelvic tumor was of sufficient size and contour to exert pressure on the ureter, usually at the pelvic brim. Naturally these changes are more prone to occur with the denser type of tumor which is fairly well fixed. It is not uncommon to find a hydroureter associated with a large intraligamentous myoma, but we have not seen such a change with a parovarian cyst. In many of the patients with large pelvic tumors intravenous urograms were made before and after operation. A striking example is here shown of the result of pressure due to a large fibroid tumor which had been

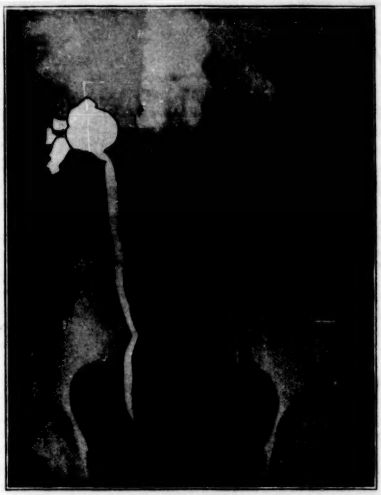


Fig. 7.—Dilatation of the ureter due to parametrial extension from carcinoma of the cervix.

present for many years (fig. 6*A*). The tumor was removed, and thirty-eight days after the operation another intravenous urogram was made (fig. 6*B*). Here is strikingly portrayed the wonderful recuperative power of the urinary tract once there has been a release of pressure and obstruction.

As is well known, one of the most frequent causes of bilateral hydroureter and hydronephrosis is parametrial carcinoma having metastasized from the cervix. In our oncologic clinic approximately 65 per cent of the patients have parametrial involvement with potential associated degenerative changes in the kidney. A common symptom observed in this group of patients is nausea and vomiting associated with a mounting nonprotein nitrogen and kidney failure. As the metastatic growth envelops the lower end of the ureter more snugly, complete anuria may ensue, with death occurring as late as ten days after the onset. Pathologic studies show the ureter completely surrounded by growth in its juxtavesical portion, and above this occlusion there is seen pronounced dilatation of the entire tract (fig. 7).

The second most important factor to be discussed is the pathology of the urinary tract as a result of parturition. As is known so well, multiple and difficult labors are the main factors in the production of relaxations and lacerations of the pelvic floor. Many of these lesions, while minimal during the earlier years, become much more pronounced near or after the menopause. The lesions in which we are here most interested are those that cause some derangement of the urinary tract. The majority of the conditions are true hernias due to stretching and tearing of the fascial supports, and it is

more common to have several coexisting lesions than single entities. Malpositions of the uterus with descensus, endocervicitis, cystocele and rectocele are common handmaidens and are all so excellently presented in the various textbooks that only certain aspects will be here discussed. We think we all are in accord that lesions that affect the bladder and urethra are much more provocative of symptoms than those that affect the rectovaginal septum. A cystocele associated with uterine prolapsus gives primarily symptoms of frequency and dysuria, and occasionally inability to empty the bladder completely if there is a dependent pouch below the urethra. Many patients state that in order to void satisfactorily the prolapsed uterus and cystocele have to be replaced. When a cystocele has existed for years with an associated descensus, cystitis is common, as the result of stasis of urine with resulting infection. Uterine prolapse may also play an important role in the production of hydroureter and hydronephrosis, as reported by various authors. The etiologic factors are due to compression of the lower ends of the ureter either at the point of their herniation through the hiatus genitalis or by the drag of the prolapsed uterine arteries.

Another condition of considerable interest is that of stress incontinence, which is characterized by involuntary spurting of urine on stress or strain; even laughing or coughing may produce this distressing situation. This condition is seen in postmenopausal women with a normal appearing urethral tube and also in women as the result of obstetric trauma, with a subsequent weakening or relaxation of the urethral sphincter mechanism. In the postmenopausal patient who suffers from stress incontinence there is frequently seen a pronounced trigonitis that accompanies the regressive tissue changes due to hypoestrogenism. The urethra is of normal appearance and there is no gaping of the internal sphincter. Topical application of silver nitrate solution of 2 to 3 per cent through the Kelly cystoscope is of great value. As many of these patients are highly neurotic, mild sedation is of great value.

In the treatment of the group due to obstetric trauma, the most satisfactory results can be obtained. Of course, incontinence due to increase of intracystitic pressure resulting, for example, from pressure of a uterine fibroid or pregnant uterus would not be alleviated by an operation on the vesical neck. The same holds true if the dribbling is due to a cord lesion. The operative procedure commonly used with us is the one described by Dr. Howard A. Kelly in 1911. He states that "the key to successful treatment lies at the internal orifice of the urethra and in the sphincter muscle which controls the canal at this point." In brief, the operation that we perform is as follows: An incision is made through the vaginal mucosa, extending from just below the external urinary meatus down within 2 to 3 cm. of the external cervical os, the tissues first having been well infiltrated with salt solution containing 10 minims of epinephrine to the ounce. This infiltration, so commonly used on the continent, greatly facilitates the separation of planes of cleavage and also allays to a great measure venous oozing. Naturally, the resulting hemostasis is more pronounced in the menopausal patients, in whom tissue regression is the rule. The vaginal mucosa is separated from the bladder wall; then, with a little care, the pubocervical fascia can be well isolated. The bladder is advanced well up on the cervix. The next step is to suture the torn or relaxed tissues at the neck of the bladder with interrupted fine silk so as to buttress the vesical neck. The pubocervical fascia is then brought together as a separate layer, following which any excess of anterior vaginal wall is excised and the wound closed. Many other operative procedures have been devised and are of great value in special cases when there is partial or complete destruction of the vesical neck. Today, with the great improvement in obstetrics, the incidence of vesicovaginal fistulas is of infrequent occurrence, the majority of destructive lesions of the ureter and bladder being due to operative accidents. Some time ago I saw an incontinent patient who had been operated on for an intraligamentous myoma. Immediately following operation no incontinence was noted; however, ten days later urine was noticed escaping from the vagina. The patient still continued to void normally. Careful cystoscopy and methylene blue injected into the bladder revealed no defect in this organ. Catheterization of the ureters demonstrated an obstruction in the left ureter at the brim of the pelvis, the right tract being normal. A urogram revealed periureteral extravasation of the opaque substance at the point of obstruction in the left ureter. With this finding it was obvious that the urine

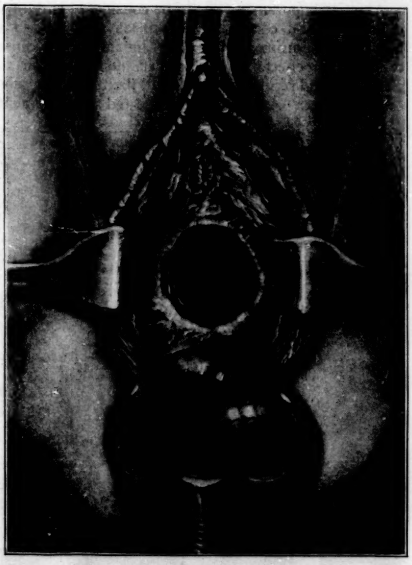


Fig. 8.—Vesicovaginal fistula, showing position of incision.

escaped by way of a tract that united with the cervical canal. This was substantiated by giving the patient methylene blue by mouth and then plugging the cervical canal with gauze; the blue stain was found on the left side of the gauze. At operation a left hydroureter and hydronephrosis were found which necessitated nephrectomy.

The following procedure for the repair of very large vesicovaginal fistulas is simple and successful: A young colored primipara had a difficult, prolonged labor and ten days post partum became incontinent. On examination in the hospital a very large vesicovaginal fistula was seen (fig. 8); the base of the bladder was nearly

completely destroyed and the defect would admit three fingers. The surrounding tissues were in good condition, so that the operation could be carried out without delay. The ureters were catheterized and the ends of the catheters were brought out through the urethra and allowed to remain for ten days. As is seen in figure 9 a circular incision was made in the vaginal mucosa about the fistulous opening at a distance of about 2 cm. from the defect. This flap was partially undercut so that it remained attached at the edge of the fistula (fig. 10). These freed flaps of vaginal mucosa then turned back on themselves so as to cover the defect and then sutured vertically one to the other by an imbrication suture, so that the broad surfaces approximated one another. The floor of the bladder was thus lined by the mucosal surface of the vaginal mucosa. The denuded defect (fig. 11) was then united transversely with interrupted number 1 chromic catgut, this being the suture material used throughout the procedure.

The patient experienced an uneventful convalescence, with good union of the tissues, and there was no incontinence.

Another important factor to be considered is the role of adnexal and cervical infections as they pertain to lesions of the urinary system. Adnexal disease causes compression effects on the ureter, depending on the chronicity and resulting fibrosis and fixation of the tuboovarian mass. As would be expected with an acute

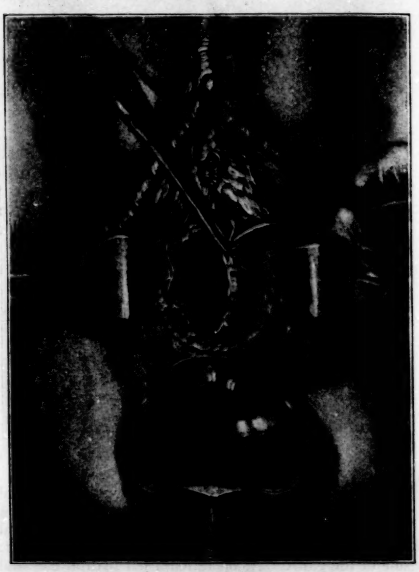


Fig. 9.—Undercut vaginal flap, remaining attached at edge of fistula, united by imbrication sutures.

inflammatory process of short duration, when the tissues are soft and succulent little effect would be exerted on the dense wall of the ureter. Everett and Sturgis,[3] in a study of 100 patients who showed varying gynecologic conditions found that dilatations of the upper tract were frequently associated with chronic salpingitis, subacute salpingitis with masses and pelvic abscesses. The incidence of percentages was 44.4, 58.3 and 57.2.

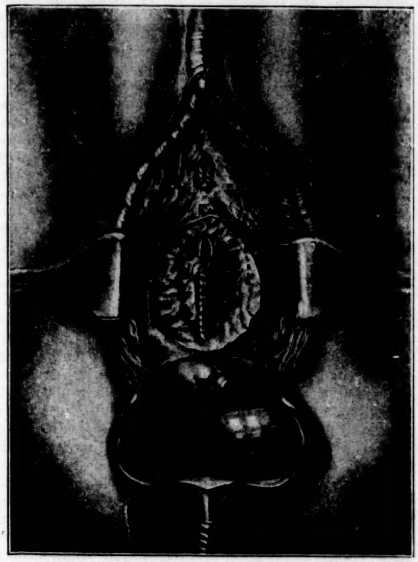


Fig. 10.—Closure of vaginal flap nearly completed in vertical line.

The work of Martin Schreiber[4] on the subject of ureteral stricture, based on the findings in one hundred consecutive autopsies, is of particular interest. From this thorough and painstaking work we quote a partial summary of his conclusions, which are pertinent to this presentation:

1. Stricture of the ureter does exist as a definite pathological entity.

2. A 12 per cent postmortem incidence of stricture or stenosis corroborates the great number of such lesions found clinically.

3. Latent symptomless hydroureter and hydronephrosis due to obstruction are relatively frequent, as evidenced by a postmortem incidence of 10 per cent.

4. Ureteral stricture as a localized intrinsic inflammatory process in the ureteral wall, due to focal infection, is relatively rare.

5. Ureteral stricture or stenosis is found most frequently in the pelvic ureter in a zone 2 to 6 cm. from the ureteral orifice.

6. Important etiologic factors in the production of ureteral obstruction are due to narrowing of a congenitally constricted site, extension of inflammatory processes from adnexal disease with and without thrombophlebitis, advanced chronic cystitis and the occluding kinking power of crossing anatomical structures, namely the vas deferens in the male and the uterine artery in the female.

As we are all aware, the incidence of ureteral stricture varies tremendously with personal interpretation. Many

3. Everett, H. S., and Sturgis, W. J.: Urol. & Cutan. Rev. 44: 638, 1940.

4. Schreiber, M.: Surg., Gynec. & Obst. 45: 423, 1927.

support their diagnosis of stricture by the demonstration of the "hang" with the wax bulb, others relying more on the finding of dilatation effects as shown by urography. We feel that if a definite stricture exists there should be a resulting dilatation which is demonstrable by urography. However, the fact remains that many patients are relieved of their symptoms following ureteral dilation even when the urogram showed no abnormality.

Knowing that a considerable difference of opinion exists as to the relationship of endocervicitis to trigonitis and cystitis, we reviewed the current literature and found a paucity of factual evidence on this subject. An experimental article of merit on the transmission of infection from the uterine cervix to the urinary tract has been presented by Winsbury-White.[5] Some of his findings pertinent to this subject will be presented. He is of the opinion that cystitis and trigonitis are constant companions of cervicitis and that the bladder infection is difficult to eradicate if the cervical lesion is not also treated. Owing to this frequent association of lesions he raises the question as to the existence of a lymphatic connection between the uterine cervix and the trigone. In order to prove his opinion he carried out the following experiments: He injected india ink and living and dead tubercle bacilli into the tissues of the cervix in some animals, and into the urethra in others. His most conclusive results were found by using india ink injections in the cervix of the guinea pig. A summary of the results of experiment 5 is as follows: The guinea pig was killed four days after the injection of india ink. Masses of the pigment were found in the lymphatics of the bladder wall. When injections were made with living and dead tubercle bacilli, inflammatory reactions were found in the bladder wall as well as in the vaginal coats. He concludes that these findings demonstrate a lymphatic connection between the cervix and the bladder as well as between the cervix and the vagina, and "therefore we may expect, as we generally find in practice, that cervicitis is accompanied by cystitis and vaginitis." The remaining portion of the article deals with the upward lymphatic migration of the india ink and tubercle bacilli following their injection into the cervix.

Wishing to determine the relationship between endocervicitis and trigonitis and cystitis, we examined cystoscopically a group of 50 women who had varying degrees of endocervicitis. A summary of this study follows: In order to designate the degree of cervicitis present, the lesions were classified from 1 plus to 4 plus; accordingly, there were found 13 patients with a 1 plus lesion, 19 patients with a 2 plus lesion, 13 patients with a 3 plus lesion and 5 patients with a 4 plus lesion. The bladder symptoms complained of were nocturia ten times and dysuria ten times; in 32 patients there were no urinary complaints. The cystoscopic results are as follows: The bladder mucosa was found normal in 47 patients, whereas the remaining 3 showed a moderate hyperemia. A normal trigone was found in 34 patients, whereas 13 showed slight degrees of injection. One patients showed a bullous edema with 3 plus injection. This definite trigonitis was associated with an Escherichia coli communior infection of the urine, and there was an accompanying 4 plus endocervicitis. Two other patients showed similar degrees of trigonitis, and in both E. coli was the offending organism. In 1 of these patients the degree of cervicitis was 3 plus and in the other only 2 plus. Mucosal tags were seen projecting into the lumen of the urethra at the internal orifice in 4 patients. The ureteral orifices were normal in 45 patients. A halo of injection was seen about both ureters in 2 patients, about the right ureter in 2 and about the left orifice in 1. Bladder cultures were obtained from all the patients except 4: negative cultures in 26, or 52 per cent, Staphylococcus albus in 8, or 16 per cent, Staphylococcus aureus in 2, or 4 per cent, Staphylococcus fecalis in 1, or 2 per cent, Clostridium tetanoides in 6, or 12 per cent, and Escherichia coli communior in 3, or 6 per cent. The cultural findings correspond quite closely to bacteriologic studies made on the bladder urines of the pregnant and nonpregnant women which we have previously reported.[6] In that study we found that the incidence of all organisms in the bladder urine of the pregnant woman was high, namely 50 per cent. However, this finding lost much of its significance when we noted that the urine of the control nonpregnant

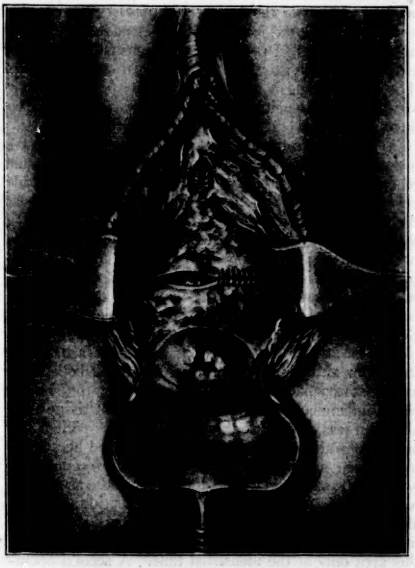


Fig. 11.—Closure of vaginal mucosa in horizontal plane.

group showed 44 per cent positive cultures, this finding corresponding rather closely to the percentage here found, namely 48 per cent positive cultures. The types of organisms isolated in this study were the same as those found in the previous investigation, all normal inhabitants of the vestibule, and we feel that many of these positive cultures are due to the entrance of the organisms into the bladder through the short, rather patulous urethra.

From this study of the relationship between endocervicitis and cystitis and trigonitis we feel that we can draw the following conclusions: Endocervicitis plays

5. Winsbury-White, H. P.: Brit. J. Urol. 5: 249, 1933.

6. Hundley, J. M., Jr., and others: Surg., Gynec. & Obst. 66: 360, 1938.

no role as a causative factor in the production of cystitis, for the bladder was normal in 47, or 94 per cent, of the patients. It would seem that the same holds true for trigonitis, for here the trigone was quite normal in 34 patients. As is well known, trigonitis is of very frequent occurrence, often of short duration, and seen frequently with diseases of the urethra, relaxations due to childbirth, postmenopausal regressive changes and many other factors. The evaluation of the trigone as to the degree of hyperemia and whether the mild changes are abnormal is difficult. From this study we feel that there is no significant relationship between pathologic conditions of the cervix and of the bladder. If lymphatic migration of organisms from the cervix to the bladder is of such common occurrence as stated by Winsbury-White, why does not malignant involvement of the floor of the bladder occur more frequently from a carcinoma of the cervix? Carcinoma of the cervix metastasizes as a rule into the parametria, either by direct growth or by lymphatic spread, probably most often by both pathways. We routinely examine cystoscopically all patients with carcinoma of the cervix, and of 413 such patients examined we found bladder involvement in only 54, or an incidence of 13.1 per cent. It is unusual to see direct extension of the growth into the lumen of the bladder. The usual finding is a submucosal extension of the cervical lesion, producing a cobblestone or knobby appearance.

A somewhat unusual but most interesting invasive lesion of the bladder from a gynecologic focus is due to endometriosis, probably produced by the retrograde reflex of endometrial tissue through the oviducts at the time of menstruation. Not all are in accord with this transtubal theory, as presented by Sampson [7] in his original article in 1921. The so-called celomic metaplasia theory is supported notably by Robert Meyer, whereas Halban believes that lymphatic dissemination is the pathway for dispersion of endometrial fragments. Some time ago such an interesting condition came under our observation. A young woman was operated on by the senior author for bilateral pyosalpinges; both tubes and one ovary had to be removed and, owing to the associated inflammatory changes in the adjacent tissues, the abdomen was drained for a short time. The patient had an uneventful recovery. Later she presented herself for observation, stating that for several months bleeding had occurred from the site of the drain tract in the abdominal wall, though only at the time of menstruation. Gradually a spherical, nodular mass was observed developing in this region, and the bleeding continued to appear from this area only at the menstrual time. A second operation was performed through the original scar, and the nodular mass was found filled with many mulberry-like cysts containing bloody fluid. When the abdomen was opened the pelvic peritoneum was studded with these same small cysts and in the wall of the bladder, at its base, a large nodule similar to that found in the abdominal wall was observed. Unfortunately a cystoscopy had not been performed, but it was definite that an endometrial invasion of the bladder was present. Two methods of treatment presented themselves, either a resection of the bladder, which would have been extensive and difficult, or the removal of the remaining ovary. It is well known that ovarian activity is necessary for the maintenance and development of these endometrial masses, and with its absence the lesions undergo prompt regression. The remaining ovary was then removed. The endometrial mass in the abdominal scar was excised so as to facilitate a better closure. The patient had an uneventful convalescence, and when later seen the nodular mass in the base of the bladder had disappeared. Unfortunately the patient refused cystoscopy; however, there was no doubt that complete regression had taken place. If this had not been the case, a cycle of high voltage x-ray therapy would have hastened its disappearance, for it is known that this lesion is sensitive to radiation. Occasionally patients with this bladder involvement give a history of intermittent hematuria, but here this was not the case. Microscopic examination of the cystic material confirmed the operative diagnosis.

There are many other conditions that probably could be discussed profitably, but a comprehensive presentation would be far too voluminous for present consideration.

7. Sampson, J. A.: Perforating Hemorrhagic (Chocolate) Cysts of Ovary, Their Importance and Especially Their Relation to Pelvic Adenomas of Endometrial Type, Arch. Surg. 3: 245 (Sept.) 1921.

COMMENT

One of the most important factors in the production of urinary tract changes is due to pressure exerted by pathologic processes arising in the female pelvis. We have given a brief summary of our previous findings on the physiologic and pathologic changes in the urinary tract during pregnancy and also have shown what effects estrogens and progestogens exert on ureteral activity. This review is of value, for the lessons here learned are of a fundamental nature and make easily understandable changes produced by pathologic factors. Quite similar dilatation changes in the urinary tract occur in the presence of large pelvic tumors; however, we do not see the hormonal manifestations described as occurring in pregnancy. The dilatations may arise at the pelvic brim or in the pelvic bowl.

The second factor discussed was pathology of the urinary tract as a result of parturition. Here were considered relaxations of the pelvic floor, with special reference to the cystocele and the frequently associated cystitis. It was also shown that uterine prolapse may be an etiologic factor in the production of dilatation of the ureter. A method for the repair of large vesicovaginal fistulas has been presented, in which the surrounding vaginal mucosa was used to cover the defect. Stress incontinence is of frequent occurrence. It is seen in the postmenopausal woman with regressive changes occurring in the bladder and trigone due to absence of estrogenic stimulation. Trigonitis is frequently associated with these regressive changes and is usually alleviated by the topical application of silver nitrate solution 2 to 3 per cent through the Kelly cystoscope. Stress incontinence is also seen as a result of obstetric trauma when there is an associated relaxation and stretching of the fascial supports. The operation devised by Howard A. Kelly is of distinct value, and its success is dependent on the proper buttressing of the vesical neck. Fistulas are of infrequent occurrence, the greatest number resulting from operative accidents and from irradiation of cervical carcinoma. With us, vesicovaginal fistulas due to childbirth are rarely seen.

We next discussed pelvic infections as they influence the urinary system. There is no doubt that chronic disease of the adnexa with or without masses causes pressure on the ureter and by inflammatory invasion produces stricture of the ureter. The work of Schreiber on ureteral stricture showed that adnexal disease was

one of the most frequent etiologic factors in its production. Wishing to determine what role cervical infections played in the production of bladder disease, we selected 50 women with varying degrees of endocervicitis, the majority having no urinary complaints. Cystoscopy was carried out, and from the accumulated data we are of the opinion that endocervicitis plays a very unimportant role in the production of bladder infections. If lymphatic migration is of such common occurrence, why does not carcinoma of the cervix metastasize more frequently to the bladder? Cystoscopy of 413 patients with carcinoma of the cervix disclosed bladder involvement in only 54, or an incidence of 13.1 per cent.

An interesting invasive lesion of the bladder from a gynecologic focus has been reviewed, namely endometriosis. This lesion is of common occurrence, and when hematuria occurs at the time of menstruation a diagnosis can be readily made. The development and maintenance of this ectopic endometrium is dependent on ovarian activity. When there is widespread involvement of the intestine, rectovaginal septum or bladder, oophorectomy may be the procedure of choice, thus avoiding a difficult and often hazardous operation.

101 West Read Street.

ABSTRACT OF DISCUSSION

DR. NELSE F. OCKERBLAD, Kansas City, Mo.: Jenkins at Yale, whose work on monkeys proved that the endocrine theory is correct, has made a contribution that will live as a starting point of the explanation of pyelonephritis of pregnancy. One point that I would like to stress is the real danger of the indwelling ureteral catheter. I had 2 patients that wore indwelling catheters for periods of five to seven weeks. One of these patients one night suddenly started to bleed into the bladder. Before anything could be discovered or done about it the patient died. The autopsy showed that there was a communication between the right ureter and the right common iliac artery. Just about three weeks later a similar case occurred. The nurse on the floor said "This is just like the first one." The patient was brought to the operating room and the incision was made, exposing the area; a communication between the right common iliac artery and the ureter was found and the artery was closed by suture, the ureter was closed and the patient's life was saved, showing that an observant nurse can be of great help. A woman aged 32 was referred to me recently by a gynecologist because of an obstruction to the urethra. There was a large mass between the bladder or the floor of the bladder and the anterior vaginal wall. This proved to be a large cyst, one of those remnants of the duct of Gartner. It was dissected out and found to contain about 300 cc. of clear fluid. Diverticulosis of the urethra is a disorder that urologists are constantly seeing. I have seen 7 cases of diverticulum of the urethra, in 1 of which was a papillary carcinoma causing complete obstruction of the urethra. This patient, however, died of another disease and the specimen obtained was unique. Many of us doing urology also repair vesicovaginal fistulas. Here is a case in which a woman had a bladder that was torn wide open from the cervix clear out through the urethra. She had no urethra. I repaired the fistula and got her down to a little tiny opening which served as a urethra. She didn't leak any at night, but in the daytime she leaked some, so I wanted to go ahead and finish the operation and make her a urethra. While I was thinking about how to go about it she came back and said she wasn't going to have another operation for she had solved the problem. I asked her how she had done it. "Well," she said, "I went to the ten cent store and got a rubber ball just the right size and inserted it in my vagina." It pressed right against the symphysis and acted as a valve and kept her dry and she said she'd have no further operation and the situation was perfect.

DR. VINCENT J. O'CONOR, Chicago: We have all seen the changes in the female urinary tract which accompany pregnancy and the presence of large pelvic tumors. Those who are interested in these changes which accompany pregnancy are in general agreement that they are due to a combination of hormonal influences with the added mechanical pressure on the ureters exerted by the gravid uterus. We are frequently confronted with the problem of "stress incontinence" in women. The majority of these patients have a definite relaxation of the pelvic floor with incompetent vesical sphincters. In most instances this condition has been preceded by multiple pregnancies. The cause and treatment of this condition are self evident. We are frequently consulted by women who have never been pregnant, who are in the late forties or fifties and who have pronounced stress incontinence but who have no decided relaxation of the pelvic floor. Urethroscopy and cystoscopy show no definite evidence of an irritative factor or relaxed sphincter condition which might account for the symptoms. We must first rule out any associated urinary tract infection, chronic interstitial type of bladder neck infection or any cause of urethral or sphincter irritability with loss of muscle tone. The possibility of neurogenic disease which accounts for a certain percentage of these instances and the exact nature of the underlying lesion may be easily overlooked without a careful neurologic examination. In many of these patients I have insisted on a procedure comparable to the Kelly sphincter reefing operation and in practically every instance the normal bladder continence was restored. A problem which frequently arises in urology is that due to the late radiation effects on the bladder and ureters in women who have been irradiated for various pelvic lesions. These changes vary from sclerotic lesions of the bladder resulting in an interstitial cystitis to strictures of the ureter and granulomatous lesions of the bladder wall, which often give the appearance of primary neoplasms. These irradiation effects may be late in their inception for from one to ten years. They are apparently due to gradual blood vessel contracture with the resultant granulomatous lesions. All patients who have had pelvic irradiation and who subsequently develop urinary dysfunction should be carefully studied from the urologic point of view. I not infrequently have seen patients when I was definitely sure that endometrial invasion of either the lower end of the ureter or of the bladder was present. However, in most of these patients and following castration or irradiation the lesions have disappeared and while there has been strong presumptive evidence of the endometrial urinary invasion I have not been able to prove it.

DR. J. M. HUNDLEY JR., Baltimore: It is unwise to leave the catheter in the ureter longer than forty-eight hours during the later weeks of gestation, for its presence tends to precipitate the onset of labor. We too find stress incontinence a troublesome problem. As a rule we find that this condition exists in women past the menopause and in those who have had trauma from childbirth. With the menopausal group the urethral tube is normal, as is the vesical neck, and frequently the only pathologic condition noted is that of trigonitis. The treatment of this condition in this group of patients consists in sedation, as frequently the patients are of a highly nervous type, and then bladder instillation of silver nitrate solution 1:1,000 biweekly. If the instillations do not give relief, topical application of silver nitrate 1 to 3 per cent is made directly to the trigone through the Kelly cystoscope. We have never operated on a patient in this group, feeling that operation is contraindicated. Cure of the patient with stress incontinence due to lacerations resulting from childbirth is as rule comparatively easy, for the difficulty here is at the vesical neck. The procedure we carry out is one devised by the late Dr. Howard A. Kelly, which consists in buttressing and supporting the tissues about the internal urinary meatus. With this procedure the repair of a frequently associated cystocele is carried out and as a rule excellent results are obtained. There are many intricate operations advised for the cure of stress incontinence, particularly when there is definite relaxation at the internal urinary meatus. However, as a rule simple plicating and buttressing of the tissues suffice.

PRECOCIOUS SKELETAL DEVELOPMENT

ROGER L. J. KENNEDY, M.D.
ROCHESTER, MINN.

In clinical pediatrics, estimation of the degree of skeletal development is frequently carried out by comparing the roentgenogram of a portion of the skeleton with one of a similar portion of the skeleton of an average or normal child of the same age. In actual practice the number of the bones of the wrist and hand and their degree of development are most widely used for such comparison.

It is recognized that well known standards such as those of Todd,[1] Flory [2] and Engel and Runge [3] must be used with allowances for variations within the norm. Although such standards may be unsuitable for strict investigational purposes they may be used to determine whether skeletal development is grossly retarded, normal or grossly advanced. This report is not concerned with minor variations from the normal or average.

Some conditions, notably cretinism, are known to be accompanied by retarded skeletal development. A good deal has been written about such retarded development. Although it has been the subject of extensive study, precocious skeletal development or early maturation has been less emphasized than has retarded development.

The results of experimental work in this field on animals can be interpreted as only suggestive when applied to conditions in the human subject.

The clinical histories of a series of children with precocious skeletal development who have been observed during the past few years have been reviewed to determine (1) in what conditions precocious skeletal development occurs and (2) the factors which may be responsible for skeletal precocity.

In respect to the factors which may be responsible for the skeletal precocity, data concerning the probable role of endocrine disturbances are incomplete. In some cases the amounts of 17-ketosteroids excreted in the urine were determined. In other cases such determinations were not considered essential to diagnosis or treatment and hence were not made.

The histories of 23 patients were reviewed. The patients may be divided into four groups. The first group includes 3 patients with proved adrenal cortical tumor (table 1). In 1 of these 3 cases in which the excretion of 17-ketosteroids was studied before operation, the excretion was 170 mg. in twenty-four hours, a value far in excess of normal. It is pertinent at this point to repeat some of the facts regarding the 17-ketosteroids which have been emphasized by Talbot and his associates [4] and by Engstrom, Mason and Kepler: [5] that the 17-ketosteroids which have their source in the adrenal glands and testes of males and in the adrenal glands of females are not all androgens. Conversely, androgens are not all 17-ketosteroids. The determination of the excretion of 17-ketosteroids, however, usually gives a rough index of androgenic activity. Other patients not included in this series had proved adrenal cortical disease but did not show precocious skeletal development.

The second group (table 2) includes 12 cases in which hyperplasia of the adrenal glands was either proved or, because of the clinical and laboratory evidence, was thought to be present. Five of the patients exhibited sexual and somatic precocity. One of the 5 had anomalous external genitalia and 1 was a pseudohermaphrodite with hypertrophy of the clitoris, hirsutism and masculine habitus. In 4 of the 5 cases, excretion of 17-ketosteroids was found to be greatly increased. Among the remaining 7 patients in this group, 1 had hypertrophy of the clitoris, hirsutism and acne; 1 showed precocious puberty and mental retardation; 1 had hypertrophy of the clitoris, hirsutism and

TABLE 1.—*Proved Disease of Adrenal Glands (Cortical Tumor)*

Case	Sex	Age, Yrs.	Bone Age, Yrs.	17-Ketosteroids, Mg. Excreted in Urine in 24 Hrs.	Diagnosis: Clinical	Diagnosis: Pathologic
1	♀	1 11/12	6	...	Adrenal cortical syndrome	Adrenal cortical tumor
2	♀	9	15	...	Adrenal cortical syndrome	Adrenal cortical tumor
3	♀	3¾	5½	170	Adrenal cortical syndrome	Adrenal cortical tumor

TABLE 2.—*Adrenal Disease (Hyperplasia) Proved and Possible*

Case	Sex	Age, Yrs.	Bone Age, Yrs.	17-Ketosteroids, Mg. Excreted in Urine in 24 Hrs.	Diagnosis: Clinical	Diagnosis: Pathologic
4	♀	3	8	5.0 5.2	Sexual and somatic precocity; anomaly of genitalia	Adrenal hyperplasia
5	♂	4	14-16	8.7 8.4	Sexual and somatic precocity	Adrenal hyperplasia
6	♀	4	7	15.8, 12.3, 14.2, 12.3, 6.8, 12.5	Sexual and somatic precocity	Adrenal hyperplasia; anomaly of genitalia
7	♂	9	10-13	21.2	Sexual and somatic precocity	Adrenal hyperplasia
8	♀	12	17	...	Sexual and somatic precocity; hypertrophy of clitoris; hirsutism; male habitus	
9	♀	1	2	0.5	Hypertrophied clitoris; hirsutism; acne	Chronic cystic oophoritis
10	♀	2½	7	...	Precocious puberty; mental retardation	
11	♀	11	18-19	...	Acne; precocious development	
12	♀	4½	5-6	1.2	Hirsutism; hypertrophy of clitoris; mental retardation	
13	♀	2	4	...	Mental retardation	
14	♂	¾	4	...	Cerebral cortical atrophy	
15	♀	4	6¼	...	Physical and mental precocity	

From the Section on Pediatrics, Mayo Clinic.

Read before the Section on Pediatrics at the Ninety-Fourth Annual Session of the American Medical Association, Chicago, June 14, 1944.

1. Todd, T. W., and others: Atlas of Skeletal Maturation, St. Louis, C. V. Mosby Company, 1937.
2. Flory, C. D.: Physical Growth of Mentally Deficient Boys, Monograph, Society for Research in Child Development, 1936, vol. 1, no. 6, p. 141.
3. Engel, S., and Runge, E.: Standards for Normal Development of Hand, Ztschr. f. Kinderh. **33**: 61-64 (July) 1922.
4. Talbot, N. B.; Butler, A. M.; Berman, R. A.; Rodriguez, P. M., and MacLachlan, E. A.: Excretion of 17-Keto Steroids by Normal and by Abnormal Children, Am. J. Dis. Child. **65**: 364-375 (March) 1943.
5. Engstrom, W. W.; Mason, H. L., and Kepler, E. J.: Excretion of Neutral 17-Ketosteroids in Adrenal Cortical Tumor and Feminine Pseudohermaphroditism with Adrenal Cortical Hyperplasia, J. Clin. Endocrinol. **4**: 152-155 (April) 1944.

mental retardation; 1 had acne and precocious puberty; 1 showed somatic and mental precocity without sexual precocity; 1 had cerebral cortical atrophy with mental retardation, and 1 showed only mental retardation.

The third group (table 3) consists of 3 patients who had been treated with endocrine preparations. Two

TABLE 3.—*Precocious Bony Development Possibly Induced by Medication*

Case	Sex	Age, Yrs.	Bone Age, Yrs.	Clinical Diagnosis
16	♀	3⅝	6	Mongolian idiot; treated for 2 years with desiccated thyroid glands
17	♂	4	6	Mongolian idiot; treated with glandular products for 3 years
18	♀	9	14	Thrombocytopenic purpura; treated with testosterone propionate

were mongolian idiots. One of these 2 patients had been treated for three years with desiccated thyroid glands and 1 had received a variety of endocrine products for three years. The third patient in this group had thrombocytopenic purpura and had been treated with testosterone propionate. She showed unmistakable evidence of precocious skeletal development. Although evidence in support of the idea that the advanced skeletal development was a result of endocrine therapy is lacking, the condition of the skeleton in these cases indicates what may result from such medication. The basis for the employment of androgenic substances in the treatment of slipped epiphysis of the head of the femur is indicated by the findings in the third case just mentioned.

The fourth group (table 4) included 5 patients with miscellaneous disorders. One was a child aged 10 months who was brought to the Mayo Clinic because of vomiting and diarrhea. An incidental finding was the presence of bony development that would be normal for a child 2 to 3 years of age. The second patient was a girl who was obese and of large stature. The third was a boy 2 years of age who was brought to the clinic because of anomalies of the eyes. His bony development was approximately that of a child 6 years

TABLE 4.—*Miscellaneous Conditions Without Apparent Adrenal Cortical Disease*

Case	Sex	Age, Yrs.	Bone Age, Yrs.	17-Ketosteroids, Mg. Excreted in Urine in 24 Hrs.	Clinical Diagnosis
19	♀	⅝	2-3	....	Vomiting and diarrhea
20	♀	9	10¾	....	Obesity; large girl
21	♂	2	6	....	Anomaly of eyes
22	♀	9½	20	....	Hemangioma of left orbit and cheek; repeated treatment with radium
23	♀	6	13	1.75	Albright's syndrome

of age. The fourth patient had a hemangioma of the left orbit and cheek. Radium had been applied repeatedly to the affected parts. The last patient in this group was a girl aged 6 years who had the characteristic features of Albright's syndrome, namely sexual and somatic precocity, pigmented regions in the skin and cystic changes in the bones. Although the patient was only 6 years of age her skeletal development was that of a child of 13 years.

In surveying the entire series of cases, certain facts become evident. The first of these is that precocious skeletal development is not a peculiarity of any single clinical syndrome. Although it was found in some cases of adrenal cortical disease with increased excretion of 17-ketosteroids, in other cases of the same condition I have found that skeletal development is within normal limits. The variety of conditions represented in the four groups of cases indicates that precocious skeletal development may be found with or without obvious endocrine disorders and that it may follow administration of endocrine preparations.

One may conclude from the foregoing evidence that known factors such as the androgens may exert effects on the skeleton which lead to precocious development or premature maturation but that such effects are not inevitable in all cases in which their excretion in the urine is increased above normal. Furthermore, it is reasonable to conclude that another factor or other factors may operate together with, or independently of, the androgens to account for skeletal precocity.

ABSTRACT OF DISCUSSION

DR. JOHN R. VONACHEN, Peoria, Ill.: I sometimes wonder if there is really such a person as a normal child, that is, one who conforms to a standard or regular form. Even the healthiest of children cannot be expected to conform to any one given type. Papers like this call attention to variations in growth and development and, of course, this contributes a great deal to the understanding of both sick and healthy children. Because of the differentiation between health and disease we must have at our disposal an understanding of what variations from the average are consistent with health and which point to the presence of disease. Routine physical examinations offer little chance for any detailed estimation of bone development. Generally measurements give only an approximate estimation of total growth. In doubtful cases, of course, we must resort to the roentgenogram. In the laboratory much work has been carried out concerning the roentgenologic estimation of healthy growth and development of bones. The fact that various centers of ossification appear at different ages beginning before birth and continuing to the age of 25 affords an ideal means for checking the progress of growth and development of the skeleton. At the same time we have the opportunity of studying the deleterious effects of previous disease processes of different age periods. I think that Dr. Kennedy has shown that there is no common denominator in this group. Evidently precocious skeletal development as far as is known is not due to a specific factor any more than retarded skeletal development is. However, the x-ray examination of carpal bones may be a practical help in clinical work, in that the absence of skeletal precocity may come with the presence of certain underlying conditions.

Number of Hospitals in New Zealand.—In accordance with the provisions of the Social Security Act, New Zealand is divided into forty-five hospital districts. In each district a board is elected which provides certain types of institutional and extra-institutional medical and nursing service. Under the jurisdiction of each board there is at least one public hospital. These hospitals vary in size and the nature of the facilities afforded according to the density and composition of the population served. There are approximately 160 public hospitals, with a combined capacity of approximately 12,200 beds. Included in this number are the general hospitals, hospitals for the treatment of infectious diseases, tuberculosis institutes, homes for convalescents, charitable institutions, and homes for the aged. In addition to these public hospitals there are 332 private hospitals with a combined capacity of approximately 3,000 beds. On the basis of these figures it is estimated that there are 97 beds per 10,000 of population, which figure is identical with the number of beds available in the United States.—Simmons, James S.: Global Epidemiology, Philadelphia, J. P. Lippincott Company, 1944.

PENICILLIN IN THE TREATMENT OF INFANTILE CONGENITAL SYPHILIS

A BRIEF PRELIMINARY NOTE

R. V. PLATOU, M.D.
ALLEN J. HILL, M.D.
NEW ORLEANS
NORMAN R. INGRAHAM, M.D.
PHILADELPHIA
MARY S. GOODWIN, M.D.
BALTIMORE
ERLE E. WILKINSON, M.D.
AND
ARILD E. HANSEN, M.D.
GALVESTON, TEXAS

This is a brief preliminary note, as of Nov. 7, 1944, concerning 69 infants with manifest early congenital syphilis who have been treated with sodium penicillin by the university groups at Baltimore, Philadelphia, Galveston and New Orleans. Penicillin was administered intramuscularly in saline solution every three hours in sixty injections over a seven and one-half day period. Total dosages used ranged from 16,000 to 32,000 Oxford units per kilogram of body weight. No other antisyphilitic treatment was given.

Preliminary Results of Penicillin Therapy in Infantile Congenital Syphilis

Thirty-Nine Infants Followed for Four to Twelve Months

	Cases	Per Cent
Clinical results:		
Course uneventful	37	
Clinical relapse	2	
Serologic results:		
Reversed to negative	21	54
Reversed to doubtful	4	10
Still positive but titer declining	9	23
Serologic relapse	5	13

In 34 of these 69 infants reactions occurred during treatment. Nearly all of these reactions were mild, consisting of moderate fever beginning on the first or second day of treatment and seldom lasting longer than three days. One infant, forty-eight hours after treatment was begun, suddenly developed severe, nearly fatal collapse. Three infants died during or soon after treatment (twenty-four hours, seven days and nine days after penicillin was started); all of these had active syphilitic lesions, were under 2 months of age and were in poor general condition. Two other infants died five weeks and fourteen weeks after penicillin; whether the latter deaths were directly or indirectly due to penicillin or syphilis is not known.

In general, the immediate response of early congenital syphilis to penicillin has been gratifying. Cutaneous and mucous membrane lesions have healed during or shortly after treatment; rhinitis has been somewhat more persistent, healing in from two weeks to two months. All dark field positive lesions have become negative within twenty-four hours after the start of penicillin therapy. Roentgenographic evidence of osteitis disappeared in two to six months, i. e. at about the same rate expected after metal chemotherapy. Regression of hepatic, splenic and lymph node enlargement, though variable, was usually complete by three months. If abnormal spinal fluid findings were present initially, these have returned to normal in all cases in from eight days to six months.

Of the 69 infants, 39 have been followed from four to twelve months. Twenty-five of these 39 now are physically normal and show doubtful or negative serologic tests (21 negative, 4 doubtful). In 9 of these 39, quantitative serologic titers are either stationary at moderately high levels or slowly declining; these infants also are well. Serologic relapse has occurred in 5 infants, and clinical relapse in 2 of these 5. Serologic relapse occurred from three to six months after treatment, and clinical relapse in each case at six months.

The dosage schedules so far employed have corresponded to a total dose of 1 to 2 million units in seven and one-half days for an adult with early acquired syphilis.

The results so far obtained in infants indicate that the present total dose and time-dose relationship schedule is not entirely satisfactory. Other modifications of this schedule should be studied with due attention to analogous results secured by various schedules in early acquired syphilis in adults. For the present, we believe that an increase in total dose with the same time-dose relationship should be tried first. Accordingly, we recommend temporarily a total dose of 40,000 Oxford units per kilogram of body weight, given in sixty intramuscular injections over a seven and one-half day period.

Attention is called to the vital necessity of adequate supportive care of acutely ill infants.

Definite relapse, serologic or clinical, should be retreated at double the original dosage. A relapse is defined as either a persistently rising serologic titer or clinical evidence of progression of the disease. Persistent positivity of the blood serologic test alone is not yet to be considered an indication in itself for retreatment. A detailed report of these and additional cases will be made by this group at a later date.

SUMMARY

Penicillin is an effective agent in the treatment of infantile congenital syphilis, but the optimum method of its use has not yet been defined.

This report represents work done under several contracts recommended by the Committee on Medical Research of the Office of Scientific Research and Development and the respective universities represented by the authors.

From the Tulane University School of Medicine (Drs. Platou and Hill), the University of Pennsylvania School of Medicine (Dr. Ingraham), the Johns Hopkins University School of Medicine (Dr. Goodwin) and the University of Texas School of Medicine (Drs. Wilkinson and Hansen).

Clinical Notes, Suggestions and New Instruments

THE MESTER (SALICYLIC ACID) TEST FOR RHEUMATIC DISEASES

JAMES W. WOODS JR., M.D., AND BERNARD I. COMROE, M.D.,
Resident in Medicine and Chief of Arthritis Clinic, Respectively, Hospital of the University of Pennsylvania
PHILADELPHIA

There is no reaction which one may apply to rheumatic subjects comparable to the tuberculin or Wassermann reactions. If such a test could be found, it might help in eliminating many of the pitfalls and difficulties in the differential diagnosis of the rheumatic diseases.

Mester described a test which he believed had a high specificity for "rheumatism." This consists in the injection of 1.0 cc. of 0.1 per cent salicylic acid in sterile water in five wheals of 0.2 cc. each into the flexor surface of the forearm in a fasting, resting subject. The latter precautions were taken because any change of posture or physiologic activity may produce a rise in the basal count of 60 to 100 per cent.[1]

1. Pepper, O. H. P., and Farley, D. F.: Practical Hematological Diagnosis, Philadelphia, W. B. Saunders Company, 1933.

The white blood cell count is determined prior to the injection and thirty minutes later. A positive test—i. e. denoting rheumatic infection—consists of a decrease of more than 15 per cent in the white blood cell count at the end of thirty minutes.

Mester believed that the reaction was positive in every kind of rheumatic infection not only of the joints but also of the heart, serous membranes, nerves and eyes. He found a positive reaction in 98 per cent of rheumatic patients, while all of his controls were said to give negative results. He thought that the test would be of value in the detection of malingering in rheumatic disorders.[2]

Lenoch[3] concluded that the test was a probable addition to our method of diagnosis of rheumatic diseases but found that it was far from infallible. The test was negative in degenerative joint disease. Lenoch warned against making a diagnosis of rheumatic joint pains or myalgia solely with the aid of this test.

Copeman[4] and Green and Freyberg[5] could not confirm Mester's findings and did not find that the test helped in the diagnosis of rheumatic diseases. They noted negative reactions in frank rheumatic disease and positive reactions in nonrheumatic conditions. Only 1 of Copeman's patients had rheumatoid arthritis, although 13 had acute rheumatic fever.

We attempted to evaluate the reliability of the Mester test in active rheumatic fever, in active rheumatoid arthritis and in nonrheumatic controls. These individuals all had increased sedimentation rates, and 7 of the group of 9 patients with rheumatic fever were febrile at the time of the test while 5 of the 16 patients with rheumatoid arthritis had an elevation of temperature. The control group of 20 patients was taken from the medical wards; 4 of these individuals had increased sedimentation rates and 6 were febrile.

Only 2 of the patients with rheumatic fever showed significant drops of more than 15 per cent in the leukocyte count; 2 showed increases of more than 25 per cent and the remainder presented little variation. In the group with rheumatoid arthritis, 5 showed a drop in leukocytes of 15 per cent or more and 5 showed a rise of 15 per cent or more. In the control group 2 showed a significant decreasc and 3 showed a significant increase in the leukocyte count thirty minutes after the test. It was found that there were no significant differences among the three groups (rheumatic fever, rheumatoid or control patients) either with or without consideration of the direction of change of the leukocyte count.

It was concluded that the Mester test for rheumatic diseases is wholly unreliable as an aid in diagnosis or differential diagnosis.

PURULENT PERICARDIAL EFFUSION TREATED WITH PENICILLIN GIVEN INTRAPERICARDIALLY

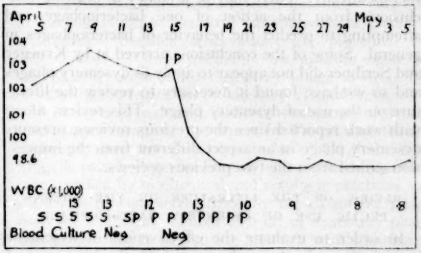
A. W. WISE, M.D., ROCK ISLAND, ILL., AND
L. E. SHAFER, M.D., DAVENPORT, IOWA

M. O. M., a white woman aged 31, was admitted to St. Lukes Hospital on April 5, 1944 with a story of fever, cough, dyspnea, chest pain, palpitation and slight hemoptysis of about four days' duration. The patient had been treated at home during this time, with a diagnosis of lobar pneumonia. She was acutely ill and apparently getting progressively worse.

The physical examination revealed that the breath sounds in the left lower chest were high pitched and tubular in character. Whispered voice and spoken voice were both greatly increased over the same area. The percussion note was dull over the entire left lower lung field. The heart tones were very faint in character and were scarcely audible even though the patient was very thin. Tension was 108/70. The heart was enlarged to the midaxillary line on the left and 3 cm. beyond the sternum on the right. A tentative diagnosis of left lower lobar pneumonia with associated pericardial effusion was made.

The x-ray examination showed definite consolidation in the left lower lobe. The heart was greatly enlarged to the left and to the right and appeared to be typical of pericardial effusion. The laboratory examination showed 13,650 white blood cells and 4,600,000 red blood cells. Hemoglobin was 11.5 Gm., with a differential of 80 per cent neutrophils and 20 per cent lymphocytes. The urinalysis showed a trace of albumin, with no other abnormalities. Blood was drawn at this time for a culture, which was subsequently negative. Sputum could not be typed, possibly because sulfadiazine had been given for four days before entrance to the hospital, but numerous pneumococci were seen. The treatment consisted of fairly large doses of sulfadiazine, which had also been given before the patient's entrance to the hospital. She was maintained on 1 Gm. of the drug every four hours for five days. Her condition became progressively worse, and dyspnea became extreme. Oxygen was given by B. L. B. mask and the patient was fully digitalized. All through this period her blood pressure was maintained fairly well, and it was thought inadvisable to do a pericardial paracentesis. The temperatures were fairly steady in the neighborhood of 103 to 104 F.

At this time we were fortunate enough to obtain a supply of penicillin for use on this patient. It was started intramuscularly and 15,000 Oxford units was given every three



Clinical course. *S*, sulfadiazine; *P*, penicillin; *IP*, intrapericardial penicillin.

hours, night and day. The sulfadiazine was discontinued at this time, and after three days of penicillin the condition of the patient had not changed very much. It was then decided to give at least one dose of penicillin intrapericardially. A pericardial paracentesis was done and about 70 cc. of turbid, definitely cloudy, blood tinged fluid was removed from the pericardial sac at that time. Then 40,000 Oxford units of penicillin in about 30 cc. of isotonic solution of sodium chloride was introduced directly into the pericardial cavity. The patient suffered no ill effects from this procedure, and within sixteen hours after this time the temperature dropped to normal and, with the exception of an occasional flare up, remained normal for the duration of her illness. Penicillin was continued intramuscularly in decreasing doses for four to five days. The pericardial fluid was inadvertently disposed of in its course through the hospital to the laboratory, and thus one must be forced to rely on our clinical judgment to say whether or not pneumococci could have been grown from it. However, it was definitely a purulent fluid and was removed from a pericardial effusion secondary to a lobar pneumonia. The patient's hospital course was uneventful for the remainder of her stay, and she was dismissed as cured on May 9, her thirty-fourth hospital day.

In our minds this case definitely represents a purulent pericardial effusion, secondary to a lobar pneumonia, which failed to respond to sulfadiazine or intramuscular doses of penicillin but which responded in dramatic fashion to penicillin when given intrapericardially.

502 Safety Building, Rock Island, Ill.

2. Mester, A.: Polska gaz. lek. **11**: 388, 1932; **12**: 915, 1933; Acta balneol. polon. **11**, 1938; Ann. Rheumat. Dis. **2**: 266, 1941.
3. Lenoch: Wien. klin. Wchnschr. **51**: 363, 1938.
4. Copeman, W. S. C., and Stewart, W.: Ann. Rheumat. Dis. **3**: 107, 1942.
5. Green, M. E., and Freyberg, R. H.: J. Lab. & Clin. Med. **27**: 81, 1941.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

The Council has authorized publication of the following report by Dr. Harry E. Morton and Mr. Frank B. Engley Jr.

AUSTIN SMITH, M.D., *Secretary.*

DYSENTERY BACTERIOPHAGE

REVIEW OF THE LITERATURE ON ITS PROPHYLACTIC AND THERAPEUTIC USES IN MAN AND IN EXPERIMENTAL INFECTIONS IN ANIMALS

HARRY E. MORTON, Sc.D.
AND
FRANK B. ENGLEY JR., M.S.
PHILADELPHIA

Within the last ten years two reports on the nature and use of bacteriophage have appeared in THE JOURNAL. The first review was by Eaton and Bayne-Jones [1] and the second by Krueger and Scribner.[2] Both of these reports covered all bacteriophages which had been used therapeutically. There may be a fallacy in drawing conclusions from the action of one bacteriophage and attempting to predict the behavior of bacteriophages in general. Some of the conclusions arrived at by Krueger and Scribner did not appear to apply to dysentery phages and so we have found it necessary to review the literature on the use of dysentery phage. This review, along with work reported since the previous reviews, presents dysentery phage in an aspect different from the impression gained from the two previous reviews.

REVIEW OF THE LITERATURE ON THE THERAPEUTIC USE OF DYSENTERY BACTERIOPHAGE

In order to evaluate the effectiveness of dysentery bacteriophage, or any other agent, in the treatment of bacillary dysentery it is necessary to demonstrate dysentery bacilli, the causative micro-organisms, in every patient studied. Moreover, it is important to determine whether or not the preparation of dysentery bacteriophage to be used therapeutically is active against the dysentery bacilli isolated from the patient. This can be done conveniently in vitro. There are differences between strains of bacteriophages as there are between different strains of bacteria. If one preparation or strain of dysentery bacteriophage does not act against a particular culture of dysentery bacilli, other strains or preparations from different sources may do so. An outstanding feature of bacillary dysentery in man is that the mortality is not very great, so, as Seidlmayer [3] has pointed out, one cannot take the reduction in mortality as a criterion of bacteriophage therapy. He suggests that the criterion of cure should be the time when the dysentery bacilli disappear from the stool. That is desirable because in the treatment of bacterial infections one is interested not only in ridding the patient of his symptoms but also in ridding him of the pathogenic micro-organisms so as to prevent a recurrence of the disease or the transmission of the micro-organisms to susceptible individuals. Using as the criterion of cure the time when dysentery bacilli disappear from the stool involves the difficulties of growing dysentery bacilli from stools which also contain a dysentery phage. Micro-organisms often fail to grow in cultures when a specific bacteriophage is also present in the specimen. This is a recognized difficulty in the laboratory diagnosis of bacillary dysentery because many patients possess a natural dysentery phage in their stools, especially during the later stages of the infection. It would be, even more, a complicating feature if dysentery phage was administered to the patient.

Kligler, Oleinik and Czazkes [4] have described a technic for culturing dysentery bacilli from specimens containing dysentery phage. It is based on the observation that dysentery phage is inactivated by high dilutions of solution of formaldehyde at a faster rate than are dysentery bacilli. Stools suspected of containing a mixture of dysentery bacilli and dysentery phage are mixed with equal volumes of dilute solution of formaldehyde so as to give a final concentration of solution of formaldehyde U. S. P. 1 to 10,000 and 1 to 7,500. Cultures of the stool suspensions are streaked on solid mediums immediately, and about six, eighteen and twenty-four hours after mixing with the solution of formaldehyde. An exposure of six, twelve or eighteen hours to the concentrations of solution of formaldehyde mentioned causes an inactivation of the dysentery phage and allows the dysentery bacilli to grow. After twenty-four hours' exposure the dysentery bacilli begin to be killed by the solution of formaldehyde. This improved technic should be valuable in a more accurate laboratory diagnosis in cases of dysentery and should be helpful if dysentery phage is being administered to the patient.

Since the issue of whether or not dysentery phage is of value as a therapeutic agent is still far from settled, the reports, pro and con, will be discussed separately.

(*a*) The following reports are frequently cited as evidence of the ineffectiveness of dysentery bacteriophage as a therapeutic agent. They are cited here with sufficient information to indicate that they are poor scientific tests or that the information is inadequate to justify the interpretation usually assigned to the reports.

Davison [5] employed dysentery phage in the treatment of 12 children with bacillary dysentery of the Flexner type. However the stool cultures of 2 of the children were negative for dysentery bacilli and in only 7 cases was the dysentery phage tested and found active against the dysentery bacilli. Of these 7 patients 4 died (ages ranged from 3 to 14 months) and 3 recovered (ages ranged from 2 to 30 months). To the 4 patients who died the dysentery phage was given orally. Of the 3 patients who survived 2 received the dysentery phage rectally and 1 received it orally. Two of the 3 patients who survived received the dysentery phage early in the course of the disease. This may be a very important factor in view of the severity of bacillary dysentery in children. The number of cases is too small to justify a statement as to the ineffectiveness of dysentery phage in the treatment of bacillary dysentery.

From the Department of Bacteriology, University of Pennsylvania School of Medicine.

1. Eaton, M. D., and Bayne-Jones, S.: Bacteriophage Therapy: Review of the Principles and Results of the Use of Bacteriophage in the Treatment of Infections, J. A. M. A. **103**: 1769-1776 (Dec. 8), 1847-1853 (Dec. 15), 1934-1939 (Dec. 22) 1934.
2. Krueger, A. P., and Scribner, E. J.: The Bacteriophage: Its Nature and Its Therapeutic Use, J. A. M. A. **116**: 2160-2167 (May 10), 2260-2277 (May 17) 1941.
3. Seidlmayer, H.: Die Behandlung der Ruhr in Kindesalter mit Bakteriophagen, Ztschr. f. Kinderh. **60**: 579-589 (Feb.) 1939.
4. Kligler, I. L.; Oleinik, E., and Czazkes, I.: Improved Technic for Isolation of Dysentery Bacteria from Stools by Formaldehyde Inactivation of Bacteriophage, Am. J. Pub. Health **33**: 682-684 (June) 1943.
5. Davison, W. C.: The Bacteriolysant Therapy of Bacillary Dysentery in Children: Therapeutic Application of Bacteriolysants; d'Herelle's Phenomenon, Am. J. Dis. Child. **23**: 531-534 (May) 1922.

Fletcher and Kanagarayer [6] tried some dysentery phage, provided by d'Herelle himself, in the treatment of 1 case of bacillary dysentery of the Shiga type and 22 cases of the Flexner type in the Federated Malay States. One tube of bacteriophage containing about 2 cc. was given orally at twelve hour intervals for three doses; in some cases a second course of three doses was given, and in others a subsequent dose was given every morning. Daily bacteriologic examinations of the stools were made, but there was no apparent reduction in the number of dysentery bacilli in the stools. Good results appeared to be obtained in the 1 case caused by Shiga's bacillus, and the dysentery phage produced complete lysis of Shiga bacilli in vitro. The dysentery phage was tested in vitro against the Flexner strains and it did not produce complete lysis of the organisms. The authors felt that an attempt should be made to find a bacteriophage which would produce a complete and permanent lysis of the Flexner strains, as was available for the Shiga strains.

Taylor, Greval and Thant [7] employed bacteriophage therapy in the Rangoon General Hospital during 1928 and 1929 with 14 cases of bacillary dysentery of the Shiga type. A mixed bacteriophage was used at the beginning of the case before isolation and identification of the causative organism. Two cc. was given by mouth three times daily. Eight cases served as controls. There was one death among the 8 controls (reported as 12 per cent mortality) and two deaths among the 14 treated cases (reported as 14 per cent mortality). There was a natural bacteriophage present in all the controls. In another series of 6 cases of Shiga dysentery and 6 controls in 1929 there were no deaths in either group. Again there was a natural bacteriophage present in all the controls. In 1929 there was also a series of 6 cases of Flexner dysentery and 6 control cases. One death from uncomplicated dysentery occurred in each group. In the control group 1 patient also died of dysentery complicated with chronic interstitial nephritis. These series of cases contribute nothing to the evaluation of the therapeutic value of dysentery phage, as the authors state that all the control cases showed the presence of a natural bacteriophage at some period. These results were also reported in part II of the report by Asheshov, Taylor and Morison.[8]

Riding [9] studied 60 cases of acute bacillary dysentery. Of sixty strains of dysentery bacilli isolated, twelve were not lysed by the standard dysentery phage. Of forty-two strains of dysentery bacilli confirmed serologically, two showed no evidence of bacteriophagy. The clinical course of bacillary dysentery was not altered by dysentery phage given orally. It is possible that the strain of dysentery phage employed was destroyed by the p_H of the fluids in the gastrointestinal tract, because 6 normal volunteers took the dysentery phage orally, and the dysentery phage could not be detected in their stools. Riding adjusted some of the dysentery phage with 0.1 normal hydrochloric acid to p_H 3 and found that there was no loss in activity of the bacteriophage. This, of course, is not comparable to the maximum acidity of the stomach.

Nabarro and Signy,[10] observing the effect of dysentery phage in the treatment of dysentery in children, concluded that the results were disappointing and did not feel justified in recommending it. They used d'Herelle's dysentery phage and stated that it did not contain any Sonne phage. During the four year period of their observations they encountered 87 cases of Sonne infection, 18 cases of Flexner Z and 1 case of Flexner W infection. From the information given, one would not expect beneficial effects of the phage therapy.

In a study of 33 infants less than 2 years old, Johnston, Ebbs and Kaake [11] used a polyvalent phage active against Sonne (R and S types), Hiss-Russell and Flexner strains of dysentery bacilli, typhoid-like organisms and some strains of colon bacilli. There were 37 children of the same age distribution in the control group. From 51 of 70 cases, organisms of pathogenic character were isolated. These included ten strains of Sonne, five Hiss-Russell or Flexner, twenty-six Schmitz, sixteen Asiaticus and two paratyphoid B. The dysentery phage was given orally with dextri-maltose solution. Clinically, no difference was observed in the two groups.

Vaill and Morton [12] administered dysentery phage to 21 patients. Only 1 control patient without phage is mentioned. Detailed observations are presented for only 5 cases. Quite justifiably the authors make no statement as to whether dysentery phage is or is not of value in the treatment of bacillary dysentery.

A closer approach to a scientific evaluation of dysentery phage therapy is the report by Kessel and Rose.[13] Although only 68 cases are included in their data, Shigella paradysenteriae Flexner was isolated from each case, verified by biochemical and serologic reactions and shown to be completely lysed by the dysentery phage used for treatment. Three to 5 cc. of dysentery phage was given orally at twelve day intervals with a minimum of three doses. Alternate cases were selected for "phage treatment" and for "controls," care being taken that comparable cases exhibited nearly uniform symptoms. In the 1930 series of cases the lytic property of the phage was tested against each organism isolated before the phage was administered. In 12 of the treated cases the dysentery phage was given on the average of four days after admission to the hospital. No deaths occurred in either the group of 12 treated cases or the control group of 10 cases. The average number of days in the hospital was 11.9 for the patients receiving dysentery phage as compared with an average of 10.1 days for the control group. In the 1931 series of cases the dysentery phage was administered within a few hours after admission to the hospital because it was found that about 90 per cent of all Flexner strains were lysed by the particular strain of dysentery phage in use. The phage later was tested against the organisms for its activity. The average number of days in the hospital was eleven for the phage treated patients as compared with 12.1 days for the controls. There were four deaths in the phage treated cases and three deaths in the control cases. Two of the four deaths in the

6. Fletcher, W., and Kanagarayer, K.: The Bacteriophage in the Treatment of Bacillary Dysentery of the Flexner Type, Bull. Inst. Med. Res., Kuala Lampur, Federated Malay States, 1927, No. 3; abstr. Lancet **2**: 402-403, 1927.

7. Taylor, J.; Greval, S. D. S., and Thant, U.: Bacteriophage in Bacillary Dysentery and Cholera, Indian J. M. Res. **18**: 117-136 (July) 1930.

8. Asheshov, I.; Taylor, J., and Morison, J.: Recherches sur le bactériophage dans l'Inde Britannique, Bull. de l'Office internat. d'Hyg. pub. **22**: 1862-1892 (Oct.) 1930.

9. Riding, D.: Acute Bacillary Dysentery in Khartoum Province, Sudan, with Special Reference to Bacteriophage Treatment: Bacteriological Investigation, J. Hyg. **30**: 387-401 (Aug.) 1930.

10. Nabarro, D., and Signy, A. G.: Observations on Dysentery in Children, Arch. Dis. Childhood **7**: 327-334 (Dec.) 1932.

11. Johnston, M. M.; Ebbs, J. H., and Kaake, M. J.: Bacteriophage Therapy in Acute Intestinal Infection (Summer Diarrhea), Canad. Pub. Health J. **24**: 443-446 (Sept.) 1933.

12. Vaill, S., and Morton, G. L.: Bacteriophage Therapy of Bacillary Dysentery, J. Lab. & Clin. Med. **22**: 594-600 (March) 1937.

13. Kessel, J. F., and Rose, E. J.: Bacteriophage Therapy in Bacillary Dysentery of the Flexner Type, Ann. Int. Med. **6**: 1193-1199 (March) 1933.

treated group and one of the three deaths in the control group occurred within twenty-four hours after admission to the hospital, and it was thought that these cases should be considered as reaching the hospital too late for any treatment to be of value. This leaves two deaths each in both the treated and the control groups.

A recent report by Boyd and Portnoy [14] describes the use in a prisoner of war camp of some dysentery phage which was captured during the retreat of the Axis from El Alamein. The highest titer of the dysentery phage against Shigella strains was 1 : 1,000 by the patch test. Either the test, as employed, was not very sensitive or the titer of the dysentery phage was not very high, because 1 : 1,000 is not a high titer for a bacteriophage. The authors stated that therapeutically the dysentery phage did not abort dysentery. Of 4,590 controls 6.16 per cent, or 283, developed symptoms of dysentery and 2.96 per cent, or 136 of these, had to be admitted to the hospital. Among the phage treated group of 4,070 prisoners 8.52 per cent, or 347, developed symptoms of dysentery and 3.1 per cent, or 126 of these, had to be admitted to the hospital. On the average it required 9.03 days for the blood and mucus to disappear from the stool of 126 control cases as compared with 9.08 days for 124 phage treated cases. The average stay in the hospital was 19.83 days for the 124 control cases as compared with 16.97 days for the phage treated cases. Based on the figures supplied by Boyd and Portnoy, dysentery phage did not abort dysentery sufficiently to prevent hospitalization or shorten the period when blood and mucus were present in the stools, but it did shorten the average stay in the hospital by 2.86 days. It must be remembered that the titer of the dysentery phage was only 1 : 1,000 by the method of testing.

Comment.—There are nine reports which are cited at various times as evidence of the ineffectiveness of dysentery phage in the treatment of bacillary dysentery. When these reports are examined few, if any, are free of criticism and should not be considered as contributing any direct evidence as to the ineffectiveness of bacteriophage therapy for the following reasons: Davidson's report really concerns only 7 cases. There was no close comparison in age of the patients, time of administration of the dysentery phage during the course of the infection or the route of administration. Fletcher and Kanagarayer thought they obtained beneficial results in the treatment of 1 case of Shiga dysentery, and there was complete lysis in vitro of the Shiga bacilli by the dysentery phage. They suggested that an active Flexner phage ought to be developed because they did not get beneficial results in the 22 cases of Flexner dysentery, nor were the Flexner bacilli completely lysed in vitro. The report by Taylor, Greval and Thant should not be considered, because the control groups in two studies were found to have a natural phage, and in another study there were only 6 treated and 6 control cases, with one death in each group. Only 40 of 60 cases in Riding's study should be considered, but he was unable to find the phage in the stools after administering it to normal volunteers. He attempted to determine whether an acid reaction inactivated the dysentery phage and found that it was not inactivated by a reaction of p_H 3. This is not comparable to the maximum acidity to which the dysentery phage might be exposed in the stomach and suggests that the technic employed for detecting the dysentery phage was inadequate. Boyd and Portnoy [14] detected dysentery phage in the blood serum and stools of 2 normal volunteers who swallowed dysentery phage as well as in 5 patients with bacillary dysentery to whom dysentery phage was given orally. Nabarro and Signy employed a dysentery phage which did not contain any Sonne phage, and yet 87 of 106 cases of dysentery in their study were caused by the Sonne bacillus. It would be expected that they would obtain unsatisfactory results. Johnston, Ebbs and Kaake employed bacteriophage in the treatment of the condition known as "summer diarrhea" in which the causative agent is too obscure to attempt to evaluate a substance like dysentery phage, which may be specific for only dysentery bacilli or even for certain strains of dysentery bacilli. The report of Vaill and Morton contained detailed observations on 5 patients and only 1 control, and even they made no attempt to evaluate dysentery phage as a therapeutic agent.

The reports by Kessel and Rose [13] and by Boyd and Portnoy [14] are the only reports of the nine cited in this section which are worthy of serious consideration. The conclusion which can be drawn from the report by Kessel and Rose is not that dysentery phage is no good in the treatment of bacillary dysentery but that a much larger series than 68 cases must be studied. In one study by these authors there were no deaths and in another study there were two deaths in each of the control and treated groups which could be attributed to bacillary dysentery. They recognized that the mortality in bacillary dysentery was very low and that some criterion other than a reduction in mortality needed to be used. They attempted to use as a criterion of cure the length of time spent in the hospital, but this is not as good for a criterion as the time of the disappearance of the organisms from the stools, as suggested by Seidlmayer.[8] The results of Boyd and Portnoy are important in that they demonstrate that dysentery phage, after being swallowed, can be detected in the blood serum, feces and urine of the patients. Although phage treatment did not lessen the percentage of individuals requiring hospitalization or shorten the period during which blood and mucus were present in the feces, in the phage treated group the average number of days in the hospital was less by 2.86. The dysentery phage had a titer of only 1 : 1,000 by the method of testing and its use was entrusted to the prisoners of war.

(*b*) The following reports are frequently cited as evidence of the effectiveness of dysentery bacteriophage as a therapeutic agent. They are cited here with sufficient information to indicate that they are poor scientific tests or that the information is inadequate to justify the interpretation usually assigned to the reports.

da Costa Cruz [15] employed dysentery phage in the treatment of 24 cases of dysentery. However, a bacteriologic study was made in only 12 of the cases. One case was caused by the Shiga strain, 6 cases by the Hiss strain, 4 cases by the Flexner strain and in 1 case no dysentery bacilli were demonstrated. In 1 of the cases caused by Flexner bacilli the organisms were resistant to the action of the bacteriophage in vitro and the bacteriophage was without effect in vivo. Two cc. doses of dysentery phage were given by mouth. Some cases showed pronounced benefit in four or five hours, some recovering after one or two doses. In 2 cases the symptoms returned on suspension of treatment but disappeared permanently on resumption of the treatment. Actually only 11 cases of bacillary dysentery are described in the study, and although the phage

14. Boyd, J. S. K., and Portnoy, B.: Bacteriophage Therapy in Bacillary Dysentery, Tr. Roy. Soc. Trop. Med. & Hyg. **37**: 243-262 (Feb.) 1944.

15. da Costa Cruz, J.: O Bacteriophago em therapeutica, Brazil-Med. **1**: 298-300 (June 2) 1923; abstr. J. A. M. A. **81**: 698 (Aug. 25) 1923.

treatment appeared to be beneficial there were no controls. In 1924 he [16] reported seemingly equally good results with a larger number of cases.

Spence and McKinley [17] obtained good results with dysentery phage therapy in a comparative study on children. Of the 20 cases in which dysentery bacilli were demonstrated in the stools (9 Shiga and 11 Flexner) 19 of the cases were treated within the first week of the disease with only two deaths ("10 per cent mortality"). There were five deaths in the control group of 12 cases ("40 per cent mortality"). The ages of the children in the treated group ranged from 4 months to 6½ years, whereas in the control group the ages ranged only from 1 to 2 years. The average time of recovery was 12.8 days in the control group as compared with 5.8 days in the treated group.

Choudhury and Morison [18] reported satisfactory results in preventing the spread of an epidemic of dysentery. Nearly all the inhabitants in a neighboring village, Nongsier, had died of dysentery and the people in Sohjarang were becoming ill. Shiga and Flexner strains were isolated from some of the patients. Two cc. of bacteriophage in 4 ounces (120 cc.) of water was given each sick person three times during the first day and subsequently twice daily. There were 18 severe cases with three deaths, no deaths among the 19 moderately severe or 43 mild cases.

Compton [19] reported on dysentery phage therapy in 66 cases, but a bacteriologic study was included for only 6 patients. Although he reported beneficial results, there was during this period of phage treatment a general lowering of the death rate for dysentery which he concluded may have been a coincidence or may have been due to the dissemination of the bacteriophage. In 1942 he [20] reported that during the period of 1928-1940 the number of cases of bacillary dysentery in Alexandria was not appreciably reduced but that the case mortality dropped from 20 per cent to 6.5 per cent. The case mortality for typhoid in Alexandria for the period of 1928-1938 remained fairly constant at about 18 per cent. In Cairo, where bacteriophage therapy was not used, the case mortality for bacillary dysentery averaged about 29 per cent for the years 1936-1938.

London [21] reported that dysentery phage compared favorably with the results obtained by emetine and salines. One of the noteworthy features of the therapy appeared to be the early loss of toxicity. This is at variance with the observation of de Costa Cruz, who stated that dysentery phage did not act on the toxins of the dysentery bacilli and for that reason it was often desirable to combine dysentery phage therapy with immune serum therapy. It was impossible for London to do bacteriologic studies, but no amebas were observed microscopically and the symptoms were those of bacillary dysentery. There were 129 cured out of 141 patients treated with bacteriophage, a mortality of 8.5 per cent. In other tea gardens in the district there were 72 cases of dysentery among the population, with a mortality rate of 12.5 per cent. The conditions under which the tests were made prevent any scientific deduction from the results as to the value of dysentery phage as a therapeutic agent. Sen [22] treated 36 cases of bacillary dysentery in children and reported the results no less striking than d'Herelle's results.

Burnet, McKie and Wood [23] observed that the presence of a highly active phage in some cases appears to determine a rapid recovery. Of 21 patients studied, the stools of 7 who recovered and of 3 who died showed an active phage in the feces, whereas 4 who recovered and 7 who died did not have an active phage in the feces.

McCay [24] reported that dysentery phage was successful in effecting a speedy cure in 30 per cent of the cases in which it was used, and in the remaining 70 per cent it appeared to have very little effect clinically. In 111 treated cases there were six deaths (5.4 per cent mortality). In the 120 untreated cases there were thirteen deaths (10.8 per cent mortality). The causative agent was isolated in nearly 50 per cent of the total number of cases.

Davenport and Johnsen [25] successfully treated 1 case of accidental infection with Flexner bacilli. The Flexner bacilli were present in the stools at the onset and phage was absent. Five cc. amounts of the Flexner phage were given by mouth for three doses. Flexner bacilli soon disappeared from the stools, and phage appeared. After about one week the stools contained neither Flexner bacilli nor the phage.

Querangal des Essarts [26] treated 190 cases of bacillary dysentery occurring during twenty-nine days on board two ships in Brest; however, the causative organism was identified in only 59 cases. There were 16 caused by Shiga, 38 by Flexner and 5 by paradysentery bacilli. A polyvalent dysentery phage was employed in the treatment of 185 cases, 5 cc. being given in alkaline water the first day, 10 cc. on the second and third days and 5 cc. on the fourth day. Blood and mucus disappeared from the stools after the second or third day, and after four days the stools appeared normal macroscopically. None of the cases showed severe toxemia. There were no controls.

Melnik, Khastovitch and Nikhinson [27] conducted several studies on the therapeutic use of dysentery phage. The preparation which they used was prepared against the Shiga-Kruse strain and was especially active against that strain. Treatment was a single dose of 5 to 15 cc. orally in saline solution repeated two or three times in some cases. Foods yielding acid products were withheld.

Charnock,[28] in summarizing some general procedures for the administration of bacteriophage, suggested that the surroundings should be alkaline.

Melnik, Khastovitch and Nikhinson recommended no food for several hours after the administration of bacteriophage; then large amounts of fluid should be given.

16. da Costa Cruz, J.: Le traitement des dysentéries bacillaires par le bactériophage, Compt. rend. Soc. de biol. **91**: 845-846 (Oct. 7) 1924; abstr. J. A. M. A. **83**: 1542 (Nov. 8) 1924.
17. Spence, R. C., and McKinley, E. B.: Therapeutic Value of Bacteriophage in Treatment of Bacillary Dysentery, South. M. J. **17**: 563-568 (Aug.) 1924.
18. Choudhury, B. K. P., and Morison, J.: The Spread of Dysentery in a Khasi Village and Its Treatment with Bacteriophage, Indian M. Gaz. **64**: 66-67 (Feb.) 1929.
19. Compton, A.: Antidysentery Bacteriophage in the Treatment of Bacillary Dysentery: Record of 66 Cases Treated, with Inferences, Lancet **2**: 273-275 (Aug. 10) 1929.
20. Compton, A.: Results of Bacteriophage Treatment of Bacillary Dysentery at Alexandria: A Statistical Retrospect, Brit. M. J. **1**: 719-720 (June 13) 1942.
21. London, J.: Bacteriophage in Its Clinical Aspect, Indian M. Gaz. **65**: 370-371 (July) 1930.
22. Sen, R.: Treatment of Acute Bacillary Dysentery in Children, Calc. M. J. **25**: 215-219 (Nov.) 1930.
23. Burnet, F. M.; McKie, M., and Wood, I. J.: Investigations on Bacillary Dysentery in Infants, with Special Reference to Bacteriophage Phenomena, M. J. Australia **2**: 71-78, 1930.
24. McCay, F. H.: Treatment of Bacillary Dysentery by Bacteriophage, Indian M. Gaz. **67**: 666-672 (Dec.) 1932.
25. Davenport, G. S., and Johnsen, S. W.: Case of Dysentery (Flexner) Treated by Bacteriophage, J. Lab. & Clin. Med. **18**: 315-316 (Dec.) 1932.
26. Querangal des Essarts, J.: Le bactériophage dans une épidémie de dysenterie bacillaire (Applications thérapeutiques et prophylactiques), Bull. Soc. path. exot. **26**: 979-981 (Oct.) 1933.
27. Melnik, M. I.; Khastovitch, R. L., and Nikhinson, I. I.: Therapy of Dysentery by Means of Bacteriophage, Ann. Bull. Metschnikov Inst. **1**: 97-108, 1935.
28. Charnock, D. A.: Phenomenon of Bacteriophagy, Am. J. Surg. **19**: 292-295 (Feb.) 1933.

Next day only gradual return to solid food was recommended. They reported that more intense diarrhea may follow the administration of bacteriophage, but it soon disappears. Their first study was in 1929 with 66 cases in which complete recovery was very rapid. Thirteen cases showed complete recovery in twenty-four hours, 25 cases in forty-eight hours, 16 cases in seventy-two hours and 17 cases in four to six days. It proved to these investigators that it is possible to eliminate the illness in two to three days in most cases. It cut down the period of time in the hospital from eight to ten days to two or three days. In another experiment with 19 children, 4 showed no beneficial results yet the Shiga-Kruse bacillus was isolated in every case. They observed that symbiosis of Shiga-Kruse bacilli with enterococci and proteus bacilli lengthened the period of recovery. In a large study there were twenty-seven deaths in 1,059 controls and four deaths in 282 phage treated cases. They reported that the death rate was reduced approximately one half, being 2.5 per cent and 1.4 per cent respectively. Three of the 4 phage treated patients who died were between 60 and 85 years of age. The fourth patient received dysentery phage on the fourth day, recovered in two days and died two weeks later of tuberculosis. These workers regarded the death rate from dysentery in the phage treated group as practically zero; but the mortality rate in the controls was only 2.5 per cent, so it is difficult to use the slight reduction in mortality as a criterion of phage therapy. They claimed that 55.3 per cent of the dysentery patients were out of the hospital four days after treatment, whereas only 18.8 per cent of the controls were out in four days.

Mikeladze, Nemsadze, Alexidze and Assanichvili [29] treated 47 cases of dysentery with dysentery phage and experienced three deaths (6.4 per cent mortality), which was about one half the mortality usually observed by ordinary methods of treatment.

Murray [30] stated that he treated successfully 146 cases of bacillary dysentery between October 1931 and February 1937 in Shanghai by giving the phage one hour before meals or three hours after a previous meal, preferably in an alkaline medium three times daily.

Haler [31] employed dysentery phage in controlling dysentery due to the Sonne bacillus in a home for 32 blind children. All those who had been sick, all those unaffected and all the staff received dysentery phage three times daily for a fortnight and thereafter one dose daily. There were no deaths and no bacteriologic study as to whether the phage was active against the organisms for each patient. The sudden cessation of the epidemic is not beyond the realm of a coincidence and, like many of the other reports cited in this section, provides no unequivocal scientific evidence which can be used in evaluating the therapeutic value of dysentery phage.

Soesman [32] used a polyvalent dysentery phage in 50 cases (17 adults and 33 children). He reported full recovery and concluded that it was a valuable agent in general practice. Guthof,[33] a battalion medical officer in a German infantry regiment, treated bacillary dysentery with Dysentery Polyfagen (Behring). Good results were obtained in two to four days in the case of 32 adults and satisfactory results were reported in 3 children with severe infections. No controls were included.

Kliewe and Helmreich [34] reported that therapeutically dysentery phage was effective in cases of mild or moderately severe Flexner Y dysentery and it effectively eliminated the carrier state in 16 men. In severe illness there was frequently an exacerbation and only occasionally improvement. Melnick, Khastovitch and Nikhinson [27] also reported that frequently the diarrhea was more intense following the administration of dysentery phage but soon disappeared.

Comment.—There are 19 reports which are cited at various times as evidence of the effectiveness of dysentery phage in the treatment of bacillary dysentery. When these reports are examined, few if any should be considered as contributing direct evidence to the effectiveness of bacteriophage therapy, for the following reasons:

The series of cases reported by de Costa Cruz in which bacteriologic studies were made was too small and there were no controls. The series reported by Soesman and by Mikeladze, Nemsadze, Alexidze and Assanichvili are likewise small. Inadequate bacteriologic studies and/or lack of controls form the basis of criticisms of the reports by Choudhury and Morison, Compton, London, Sen, McCay, Murray, Querangal des Essarts, Guthof and Haler. In the report by Spence and McKinley the ages of the children in the control group varied from 1 to 2 years, whereas the ages of those in the treated group varied from 4 months to 6.5 years. In view of the difference in severity of bacillary dysentery in different age groups and the small number of cases, this report cannot be given much weight in evaluating bacteriophage therapy. Burnet, McKie and Wood did not commit themselves on the effectiveness of bacteriophage therapy but merely reported the observation that those individuals who recovered from bacillary dysentery had an active bacteriophage in their feces more often than the patients who did not recover. The single case reported by Davenport and Johnsen cannot, in itself, contribute much in evaluating the effectiveness of bacteriophage therapy in bacillary dysentery, which has such a low mortality in adults.

In the largest number of cases reported in any one study, Melnik, Khastovitch and Nikhinson observed only 2.5 per cent mortality in 1,059 controls as compared with 1.4 per cent mortality in 282 phage treated patients. Of greater significance was that 55.3 per cent of the phage treated patients were out of the hospital four days after treatment, whereas only 18.8 per cent of the controls were out of the hospital in the same time. This might be a better criterion than the decrease in mortality, provided bacteriologic studies were made to insure that the dysentery bacilli had been eliminated from the intestinal tract and that there was not merely the alleviation of symptoms. An interesting observation by these workers was that the symbiosis of Shiga-Kruse bacilli with enterococci and proteus bacilli lengthened the period of recovery. This may be one explanation why dysentery phage may work in 1 case and not in another in spite of the fact that the same strain of the dysentery bacillus may be present and the organism lysed in vitro in each case. Many workers have failed to make bacteriologic studies of their cases to make sure that dysentery bacilli were present, so of course

29. Mikeladze, C.; Nemsadze, E.; Alexidze, N., and Assanichvili, T.: Sur la traitement de la fièvre typhoide et des coliteś aigues par le bactériophage de d'Herelle, Medicine (suppl.) **17**: 33-38 (June) 1936.
30. Murray, J. E.: The Treatment of Bacillary Dysentery with Bacteriophage, Practitioner **141**: 199-201 (Aug.) 1938.
31. Haler, D.: Use of Bacteriophage in Outbreak of Institutional Dysentery, Brit. M. J. **2**: 698-700 (Oct.) 1938.
32. Soesman, J.: De Polyphaagbehandeling van Bacillaire Dysenterie in de algemeen praktyk, Geneesk. Tijdscher. v. Nederl.-Indië **81**: 1862-1874 (Sept.) 1941; abstr. Biol. Abstr. **16**: 684 (March) 1942.
33. Guthof, O.: Die Behandlung der Ruhr bei der Truppe mit Bakteriophagen, Deutsche med. Wchnschr. **67**: 375-376 (April) 1941.
34. Kliewe, H., and Helmreich, W.: Ueber Ruhrbakteriophagen, München. med. Wchnschr. **88**: 617-619 (May 30) 1941; abstr. War Med. **2**: 1045-1046 (Nov.) 1942.

the effect of the association of other organisms with the dysentery bacilli has been overlooked, for the most part. The report of Kliewe and Helmreich did not give sufficient details on the therapeutic trials to warrant any more serious consideration than other reports which have been cited. The curing of the 16 carriers is not a definite accomplishment unless one knows that the dysentery bacilli were actually eliminated from the intestine and not that the workers failed to culture the bacilli in the presence of their specific bacteriophage. Some precautions such as those described by Kligler, Oleinik and Czazkes [4] would have to be employed in order to obtain unequivocal results.

REVIEW OF THE LITERATURE ON THE PROPHYLACTIC USE OF DYSENTERY BACTERIOPHAGE

Persons of all ages are susceptible to bacillary dysentery. It often is endemic in certain areas and frequently becomes epidemic. Except in infants and debilitated persons the mortality rate is not very great, whereas the morbidity rate may be high. An agent which would prevent infection of individuals with dysentery bacilli would be highly desirable. It becomes even more important when the normally hygienic living conditions throughout the world are disrupted by the conditions brought about by war. Only a few reports deal with the prophylactic value of dysentery phage.

Morison [9] appears to have been the first to try dysentery phage prophylactically. Two doses of phage were given orally to prisoners during each week of September. During that time 5 cases of dysentery appeared among the 192 prisoners receiving dysentery phage (2.6 per cent morbidity). Among 169 prisoners not receiving dysentery phage, who served as controls, there were 28 cases of dysentery (16.5 per cent morbidity).

Melnik, Nikhinson and Khastovitch [35] undertook field trials. The control group, comprising 1,126 children ranging in age from 1 to 15 years and living in the same districts as the other children, experienced 72 infections, or a morbidity of 6.38 per cent. Those treated were divided into two groups. The first group, comprising 692 children ranging in age from 1 to 15 years, received a dose of dysentery phage orally every two weeks, so that during June, July and August each child received a total of seven doses. There were 10 infections, or a morbidity of 1.44 per cent. The second group, comprising 662 children of the same age variation, received dysentery phage plus sterile ox bile under the same conditions. Only 1 child acquired bacillary dysentery, or a morbidity of 0.15 per cent.

Kliewe and Helmreich [34] tested the prophylactic action of dysentery phage on German soldiers. One hundred and thirteen took 10 cc. of dysentery phage following a dose of sodium bicarbonate in ½ cup of tea or coffee on three successive mornings. In the same unit 250 men served as the controls. None of the treated soldiers developed dysentery, whereas there were 10 cases among the controls.

Boyd and Portnoy [14] tested prophylactically on prisoners of war some dysentery phage captured during the retreat of the Axis from El Alamein. The number of prisoners in the phage treated group varied from 672 to 811. The incidence of bacillary dysentery per thousand for the four weeks prior to the administration of dysentery phage was 27.58, whereas the rate per thousand during the four weeks following the administration of dysentery phage was 19.5. The number of prisoners in the control group varied from 2,081 to 2,297. The incidence of bacillary dysentery per thousand during the same four weeks prior to administration of dysentery phage to the treated group was 11.35, and the rate per thousand for the same four weeks following the administration of phage to the treated group was 10.29. The number of prisoners in the treated group, which was less than 1,000, was about one third of the number in the control group.

35. Melnik, M. I.; Nikhinson, I. M., and Khastovitch, R. I.: Prevention of Dysentery by Means of Bacteriophage, Ann. Bull. Metchnikov Inst. **1**: 89-96, 1935.

REVIEW OF THE LITERATURE ON THE ACTION OF DYSENTERY PHAGE IN EXPERIMENTAL ANIMALS

It is logical that the in vivo action of dysentery phage should be tried in experimental animals following the observation of the lytic action in vitro. Such reports in the literature are not very numerous, and a fair proportion of them have not appeared until recently. It is obvious that early workers employed dysentery phage on human beings with no more indication for success than the fact that the phage lysed dysentery bacilli in the test tube. Indeed, many instances are reported in which dysentery phage was used indiscriminately. The improvement in our knowledge on animal experimentation during the last twenty-five years has better demonstrated protective action of dysentery phage in vivo. Perhaps it will lead to a more scientific trial of dysentery phage in human beings.

Studying the effect of Shiga phage on infections in rabbits produced by the Shiga bacillus, Kabéshima [36] found that after the intravenous injection of Shiga phage the bacteriophage entered the bile and was able to exercise its lytic action on the Shiga bacilli. Otto and Munter [37] claimed that they confirmed the basic finding of d'Herelle. Bacteriophagy succeeded even in animal experiments. Appelmans [38] found that when bacteriophage was injected into guinea pigs it was present in the spleen for at least five days but not in the liver, kidneys, heart, blood, urine, testicles or lungs. When bacteriophage on bread was fed to mice and guinea pigs, it appeared in the stools but not in the organs of the animals killed. Injected, the bacteriophage passes into the blood stream in a few hours. It is eliminated through the kidney and intestine and thus disappears completely in twenty-four to forty-eight hours. The latter observations are at variance with more recent work in which mice were the experimental animals. Bacteriophage is generally accepted as particulate in nature, and it is quite unlikely for a foreign particle to be completely eliminated from a normal animal twenty-four to forty-eight hours after injection. If the blood was tested in liquid medium for the presence of bacteriophage, the lytic action may have been inhibited or masked by the presence of the blood. If a solid medium was employed, the appearance of the lytic areas may have been so altered after exposure of the bacteriophage to the body fluids as to be not readily recognizable. Perez-Otero (personal observations, Morton and Perez-Otero) observed that when testing the heart's blood from mice for the presence of dysentery phage the plaques sometimes were nearly microscopic in size. The minute plaques were detected with the unaided eye only by proper illumination. More important than detecting the presence of bacteriophage

36. Kabéshima, T.: Thérapie expérimentale des porteurs de germs, Compt. rend. Acad. d. sc. **170**: 71-72 (Jan.) 1920.
37. Otto, R., and Munter, H.: Zum d'Hérelleschen Phänomen, Deutsche med. Wchnschr. **47**: 1579-1581 (Dec.) 1921.
38. Appelmans, R.: Le bactériophage dans l'organism, Compt. rend. Soc. de biol. **85**: 722-724 (Oct.) 1921.

in the blood is the demonstration of a protective action of the bacteriophage. Arnold and Weiss,[39] working with Shiga phage, demonstrated protective action in rabbits. They showed that the bacteriophage was present and active in the blood stream five minutes after injection.

Eliava [40] failed to find any protective action of dysentery phage when the dysentery phage was injected six hours later or simultaneously with the infecting dose of Shiga bacilli. If the dysentery phage was allowed to come in contact with the Shiga bacilli in vitro even for a few seconds prior to injection into rabbits the animals were protected. Normal rabbit serum or a 5 per cent suspension of rabbit erythrocytes had no effect on the bacteriophage.

After the subcutaneous injection of Shiga phage into guinea pigs, Smirnow and Goldin [41] detected it in the spleen after seventeen days, in the lymph nodes after thirteen days, in the liver after three days and in the blood after two days. In the case of immune guinea pigs the bacteriophage was present after twenty-four hours but not after forty-eight hours, which is to be expected. Specific antibodies combine with the foreign particle when introduced and bring about rapid elimination from the immune animal's body.

The Rakietens [42] observed that developing chick embryos were killed with relatively small numbers of Flexner bacilli. Death of the embryos could be prevented by dropping a small amount of dysentery phage onto the chorioallantoic membrane five hours after the inoculation of the embryos. There appeared to be a relationship between the survival of the embryos and demonstrable proliferation of the bacteriophage. MacNeal, Blevins and Pacis [43] studied the protective action of anti-Sonne phage in protecting chick embryos against infection with Shigella paradysenteriae, variety Sonne. The dysentery phage protected 60 per cent of the embryos for four days, compared with a survival of 19 per cent in the controls. Only 2 per cent of the live embryos hatched in the control group, as compared with 28 per cent in the group treated with Sonne phage, which is a significant difference in mortality rates.

By injecting Shiga bacilli intracerebrally, Dubos, Straus and Pierce [44] were able to produce a meningitis in mice which was fatal in three to ten days. Shiga phage injected into the general circulation of the mice can multiply in the brain of infected mice. Under proper conditions the Shiga phage protects the mice against the fatal infections, and the protection appears to depend on the early establishment of a high bacteriophage level in the infected animal.

Employing white Swiss mice as experimental animals and Flexner strains of dysentery bacilli, Morton and Engley [45] demonstrated prophylactic and therapeutic actions for dysentery phage. Separate groups of 3 mice each were injected intraperitoneally on successive days for seven days with 1 cc. of dysentery phage containing approximately 1 billion phage particles per cubic centimeter. Groups of mice were injected in a similar manner with the same bacteriophage after its lytic activity had been destroyed by heat. On the seventh day all the mice received 10,000 lethal doses of dysentery bacilli (4 bacilli constituted 1 minimum lethal dose). The mice receiving the heat inactivated dysentery phage died, whereas those receiving the active dysentery phage remained well, thus demonstrating the prophylactic action of the dysentery phage. If 1 cc. of dysentery phage was injected intraperitoneally practically simultaneously with 12,000 lethal doses of dysentery bacilli, the mice remained well. A majority of the mice could not be protected if more than three hours elapsed between the infecting dose of dysentery bacilli and the injection of dysentery phage. A strain of dysentery phage developed against the X type of Flexner bacilli protected mice against either the X or the Z type of Flexner bacilli. A strain of dysentery phage developed against the Y type of Flexner bacilli protected mice against virulent bacilli of the Z type. The X and Y dysentery phages lysed the X and Z types in vitro. Dysentery phage developed against the X type failed to lyse in vitro a virulent strain of the Newcastle type of Flexner bacilli, and it also failed to protect mice.

In the therapeutic tests when 2 out of 3 mice were protected, the ratio of phage particles to virulent dysentery bacilli was 1:8 in the case of X phage and the homologous X strain of bacilli, 1:7 in the case of X phage and a Z strain of bacilli and 1:5 in the case of a Y phage and a Z strain of bacilli. It is doubtful whether it would be possible to protect mice or other animals against so many virulent organisms with such a small amount of bacteriophage unless more of the specific bacteriophage was in some way produced within the body of the infected animals. The Rakietens [42] observed a proliferation of Flexner phage in chick embryos which survived the experimental infections. Dubos, Straus and Pierce [44] also demonstrated multiplication of Shiga phage in mice experimentally infected with Shiga bacilli. Morton and Perez-Otero [46] demonstrated quantitatively the increase of dysentery phage in mice. They also demonstrated that the dysentery phage is not eliminated completely from the circulating blood of mice in a couple of days, as was reported by some of the earlier workers. One cc. of dysentery phage containing 1,400,000,000 particles was injected intraperitoneally into mice. After twenty-four hours there were on the average 30,000,000 particles per cubic centimeter of blood as taken from the heart. There was a gradual decrease in the titer of the phage in the blood until seven days after the initial injection, when there were slightly less than 50 particles per cubic centimeter of blood. On the fourth day following the initial injection of dysentery phage, the titer of the phage in the blood of the mice was about 200 particles per cubic centimeter. If the mice at this time were injected with virulent dysentery bacilli not susceptible to the dysentery phage in the test tube, the mice died rapidly without any appreciable increase in the titer of the dysentery phage in their blood. However, if the mice were injected with virulent bacilli susceptible to the dysentery phage in the test tube, the mice remained well and there was an increase by as much as 80,000 fold in the amount of dysentery phage in the circulating blood. Within one hour after the intraperitoneal injection of dysentery bacilli into normal mice, it is possible

39. Arnold, L., and Weiss, E.: Prophylactic and Therapeutic Possibilities of Twort-d'Herelle's Bacteriophage: Preliminary Paper, J. Lab. & Clin. Med. **12**: 20-31 (Oct.) 1926.

40. Eliava, G.: Au sujet de l'adsorption du bactériophage par les leucocytes, Compt. rend. Soc. de biol. **105**: 829-831 (Jan.) 1930.

41. Smirnow, P., and Goldin, M.: Das Schicksal des parenteral einverleibten Bakteriophagen in tierischen Organismus, Centralbl. f. Bakt. (part 1) **122**: 512-515 (Oct. 20) 1931.

42. Rakieten, T. L., and Rakieten, M. L.: Bacteriophagy in the Developing Chick Embryo, J. Bact. **45**: 477-484 (May) 1943.

43. MacNeal, W. J., Blevins, A., and Pacis, M.: Test of Antidysentery Agents in Embryonated Eggs, J. Bact. **46**: 111 (July) 1943.

44. Dubos, R. J.; Straus, J. H., and Pierce, C.: The Multiplication of Bacteriophage in Vivo and Its Protective Effect Against an Experimental Infection with Shigella Dysenteriae, J. Exper. Med. **78**: 161-168 (Sept.) 1943.

45. Morton, H. E., and Engley, F. B., Jr.: Protective Action of Dysentery Bacteriophage in Experimental Infections in Mice, J. Bact. **47**: 475 (May) 1944.

46. Morton, H. E., and Perez-Otero, J. E.: The Generation of Dysentery Bacteriophage in Vivo During Experimental Infections in Mice, J. Bact. **47**: 475-476 (May) 1944.

to demonstrate a bacteremia. In the case of mice possessing dysentery phage in their circulating blood it is also possible to demonstrate both dysentery phage and dysentery bacilli. The dysentery phage was inactivated with diluted solution of formaldehyde following the technic of Kligler, Oleinik and Czazkes [4] in order to cultivate the dysentery bacilli successfully. This would imply that bacteriophagy may take place in the blood stream in addition to other places in the animal body.

Comment.—Within a year and a half five reports have appeared demonstrating, without any doubt, the fact that bacteriophagy can take place in vivo and protect developing chick embryos and white mice against fatal infections of dysentery bacilli. Three of the five reports demonstrated that the amount of bacteriophage increases when bacteriophagy takes place in vivo. There is only one report in the literature of the failure of dysentery phage to protect experimental animals. That is the report in the French literature of Eliava, and he was using the Shiga strain, the most toxic of the dysentery bacilli. Kabéshima, Arnold and Weiss and Dubos, Straus and Pierce used the Shiga strain and demonstrated protective action of Shiga phage in vivo, so perhaps the report of Eliava can be ruled out on the basis of personal technic. The earlier reports (Appelmans in 1921 and Smirnow and Goldin in 1931) on the rapid elimination of dysentery phage from the circulation are at variance with what we would expect following the injection of foreign particles into a normal animal. The quantitative work of Dubos, Straus and Pierce and of Morton and Perez-Otero offer proof that dysentery phage is not completely eliminated from the blood in twenty-four and forty-eight hours.

The quantitative work by Morton and Engley is important in that it demonstrates how little dysentery phage is really needed in protecting animals from experimentally induced infections with dysentery bacilli. Most investigators have worked with an amount of phage far in excess of that needed for protection. This may lead to erroneous assumptions of the amount of bacteriophage needed in treating animals larger than mice.

COMMENT AND SUMMARY

The history of dysentery phage may be divided into three phases. The first and most exciting period was the discovery by d'Herelle of the invisible agent which causes transmissible lysis of dysentery bacilli in the test tube. This phenomenon, called bacteriophagy by d'Herelle, was found to take place with micro-organisms other than Shigella, so that now it is regarded as commonplace. The second period in the history of dysentery phage was the attempt to use this microscopic parasite for bacteria in the treatment of bacillary dysentery in man. Many of the trials were not carefully planned scientific experiments, so the reports of such trials contributed little if anything toward evaluating dysentery phage as a therapeutic agent. Trials were made without suitable controls. Often a bacteriologic diagnosis of bacillary dysentery was not made; frequently no attempt was made to determine whether the dysentery phage was active against the patient's strain of dysentery bacilli, and often the results were of no statistical importance because of the small number of patients employed. There are about twice as many favorable as unfavorable reports on the use of dysentery phage therapeutically, but the conditions under which the tests were carried out make all the reports, seemingly good or bad, unsuitable for scientific evaluation. Only a few investigators used the dysentery phage prophylactically, and these reports appear more encouraging than the therapeutic reports. The third phase of the history of dysentery phage has been the in vivo tests, attempts at preventing or curing experimentally induced infections in laboratory animals. The majority of these tests demonstrate that dysentery phage has a definite prophylactic and therapeutic action against experimentally induced infections with dysentery bacilli, both the Shiga and Flexner varieties. All of five recent reports are in agreement in this respect.

The next phase in the history of dysentery phage should be carefully planned prophylactic and therapeutic trials on human beings, taking advantage of the knowledge gained from in vitro tests and in vivo tests on experimental animals. Quite illogically, tests on man were made before the dysentery phage was tried on experimental animals.

In summary it may be stated that:

1. The reports on the therapeutic trials of dysentery phage in man are inconclusive. This is in part due to the nature of the experiments, and the problem of the therapeutic action of dysentery phage must be considered as still unsettled.

2. In experimentally induced infections with dysentery bacilli in laboratory animals, dysentery phage has demonstrated an unmistakably therapeutic action.

3. In therapeutic trials it is necessary to perform a bacteriologic diagnosis and demonstrate dysentery bacilli in each case.

4. Susceptibility of the patients' organisms to the bacteriophage to be employed should be demonstrated in vitro in each case.

5. The criterion for cure should be the disappearance of the dysentery bacilli from the stools. This should be verified by repeated cultures, perhaps employing a technic such as that of Kligler, Oleinik and Czazkes,[4] which makes possible the cultivation of dysentery bacilli even in the presence of a specific dysentery phage.

6. It is necessary to know that the dysentery phage reaches the dysentery bacilli in an active form.

7. Obviously, suitable controls are necessary. These should be of comparable age and duration of illness and should be free of a natural bacteriophage. Determining the presence of the same pathogenic organism in the controls and its susceptibility to the dysentery phage is not sufficient. Other organisms in the intestinal flora, in both the controls and the treated patients, should also be investigated in case symbiosis with other organisms interferes with the therapeutic effect of bacteriophage, as Melnick, Khastovitch and Nikhinson thought it did.

8. Prophylactically, it has been shown that dysentery phage is capable of preventing bacillary dysentery in man and also capable of preventing lethal infections experimentally induced in laboratory animals.

9. It is necessary to know that the dysentery phage will be active against the strains of dysentery bacilli to be encountered.

10. No lytic action in vitro, no protective action in vivo.

11. A very striking feature of the in vivo action of dysentery phage has been the small amount of dysentery phage required for the protection of experimental animals. A ratio of 1 phage particle to 8 virulent dysentery bacilli has been shown to afford protection in animal experiments.

12. Bacteriophage is unique among antibacterial substances in that, as it is used to destroy bacteria in the animal body, more of the active agent is produced.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street - - Chicago 10, Ill.

Cable Address - - - - "Medic, Chicago"

Subscription price - - - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, MARCH 10, 1945

THE SUPPLY OF PREMEDICAL AND MEDICAL STUDENTS

The Council on Medical Education and Hospitals has repeatedly urged the necessity for changes in the present policies of governmental agencies, including the Selective Service System, having to do with the education of premedical students. The regulations now in force threaten either a reduction in freshmen enrolments or a far poorer quality of students in late 1945 and 1946. The House of Delegates of the American Medical Association at its meeting in Chicago in June 1944 took official cognizance of the seriousness of this problem and addressed communications to the President, to the War and Navy departments and to the Selective Service System urging that immediate steps be taken to remedy the situation.

Now official notice of this threat to medical education and medical standards has been taken by Senator Allen J. Ellender of Louisiana, who introduced on February 26 Senate Bill 637, which has been referred to the Committee on Military Affairs and which is printed in full elsewhere in this issue (p. 599). The bill includes provisions for the deferment of adequate numbers of premedical students for a period of two years and further provides for the deferment of such numbers of medical students as will be sufficient to supplement civilian sources of students for the maintenance of full classes. The bill also calls for the return to medical and premedical studies of qualified members of the armed forces who have honorably served for a year in the military forces. The latter provision may require some clarification, especially as regards the selection of students for this type of training.

At the time of introducing his bill, Senator Ellender pointed out that the discontinuance of the Army Specialized Training Program and the Navy V-12 Programs would, with a few exceptions, soon result in the cessation of the admission of new students to the freshmen classes in the medical and dental schools. This is a manpower problem of the present moment, he said, only because a critical shortage of doctors and dentists after 1948 must be anticipated and can be prevented only by action taken now, before September 1945. The army and navy medical corps are certain to need more physicians after the war than were required before this war started; the Veterans Administration will demand eight or ten thousand doctors; physicians will be required to administer the features of the compulsory military training program if that should be provided by Congress and an unknown number of doctors may be wanted to provide the most basic needs of the now occupied countries of Europe, where no medical education has been possible for five or more years. All these requirements are likely to result in a greater deficit of medical men than ever before. The profession is being depleted by about four thousand deaths and an unknown number of retirements annually, Senator Ellender said, and this picture will add up to a very serious situation unless a continuous flow of medical student graduations is maintained annually.

The introduction of this bill represents a great step forward toward the objectives of continued medical education and adequate training of qualified young men. The main outlines of this bill are fully endorsed by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges, both of which took part in several conferences on the proposals embodied in the bill with a representative of Senator Ellender. Both medical groups will doubtless participate in the hearings to be held on this bill, the principal provisions of which should receive the full and active support of medical schools and medical societies everywhere.

SENTIMENTALISM ABOUT DOGS

A bull terrier, a family pet, in an unexplained outburst seized and killed the 21 month old daughter of its owners by shaking the child until its neck was broken. The incident may be dismissed as an accident, tragic and horrible. Admittedly large numbers of instances are available in which dogs have been faithful companions, guardians and sometimes martyrs to the interests of their owners. In the present instance the owners of the dog concluded that the dog was dangerous and that the only thing to do was to have him killed. The destruction of the dog is to be accomplished by humane society authorities and apparently is a calmly reasoned act, all the more remarkable in view of the emotional tension in which the stricken parents must be living.

When this decision was reached by the parents, numerous self-styled dog lovers apparently deluged them

with telephone calls, letters and telegrams; one apparently even attempted legal action to save the life of the dog. The total lack of consideration and the crass indifference shown by these busybodies toward the grief and bereavement of the parents is almost unbelievable; yet these are the stuff of which antivivisectionism is made. To them the life of a dog is more important than the life of a child. Their warped mentalities conceive that this dog should be saved and pampered, perhaps to kill another child, certainly to be a constant care, expense and potential menace. The same muddled thinking would deny the use of animals to scientists in the laboratory, preferring that rats, mice, guinea pigs and frogs should live even if the lives of human beings must be lost in consequence.

The deadly influence of antivivisectionism on character, keenly perceived and analyzed by the late Dr. W. W. Keen, is an ever present menace. Uninformed people leave money, sometimes in large amounts, to be spent in cynical disregard of public welfare and public health by conscienceless executive secretaries who fatten on the gullibility of their own clients. Their antivivisectionism functions contrary to the interests of the animals which they profess to serve, for animals also are beneficiaries of animal experimentation. An incident such as that which forms the basis of this editorial serves to reemphasize the difficulties faced by physicians and scientists in attempting to carry out their service to mankind by experiments on animals.

THE PROGRESS OF THERAPY

Physicians, listing the ten most important drugs used in medicine in 1910, chose them in the following order: (1) ether, (2) morphine, (3) digitalis, (4) diphtheria antitoxin, (5) smallpox vaccine, (6) iron, (7) quinine, (8) iodine, (9) alcohol and (10) mercury. Just five years previously the Council on Pharmacy and Chemistry had been established to eliminate from medicine the shotgun therapy based on indiscriminate empirical remedies. Out of their efforts came such works as Useful Drugs. The same impetus brought about intensive revision of the United States Pharmacopeia, which today, along with Useful Drugs and New and Nonofficial Remedies, may be said to constitute the proved armamentarium of the physician.

Tremendous advancement has occurred in the field of therapy since 1910—so great indeed that it is almost impossible to list today ten individual remedies which might be said to be the ten most important or useful in medical practice. In an effort to determine what leaders in medicine might choose as most important in 1945 the editor of THE JOURNAL addressed a communication to some of the professors of medicine in leading medical schools.[1] The largest number of replies put penicillin first. In considering penicillin, however, other antibiotic drugs were added. Certainly the sulfonamides come exceedingly close from the point of view of their application under a wide variety of circumstances. At least five of the physicians consulted placed morphine first on the list of important drugs, yet many added to morphine the names of some of the barbituric acid derivatives. Ether still merits a place on any list of important drugs, but today the anesthetist has access to nitrous oxide-oxygen, cyclopropane, ethylene, local anesthesia, spinal anesthesia and continuous caudal anesthesia as well as the basal anesthetics injected directly into the blood. Digitalis still holds a place among the most important of remedies. The diphtheria antitoxin of 1910 is now supplemented by innumerable antitoxins and vaccines established as specific against certain infections. New on the modern list are blood plasma, whole blood for transfusions, gamma globulin and all of the other substances derived from blood. Little was known in 1910 of the products of glands. Today the life-saving properties of insulin, liver extract, estrogenic and male sex hormones, adrenal and thyroid are unquestioned. Little was said in 1910 about vitamins, but the vitamins must be included in any significant list because of their specific virtues in cases of established deficiencies such as rickets, scurvy, pellagra and beriberi. Questionable on any modern list would be the arsphenamines. If penicillin develops as is anticipated in the treatment of syphilis, the arsphenamines may go far down on any list of important remedies. Since malaria appears to be the most widespread of all diseases on the face of the earth, the quinine of previous generations must be assisted by quinacrine and other specific antimalarial remedies.

A 1945 list of the most important remedies might be:

1. Penicillin and the sulfonamides and antibiotics.
2. Whole blood, blood plasma and blood derivatives.
3. Quinine and quinacrine.
4. Ether and other anesthetics, morphine, cocaine and the barbituric acid derivatives.
5. Digitalis.
6. Arsphenamines.
7. Immunizing agents and specific antitoxins and vaccines.
8. Insulin and liver extract.
9. Other hormones.
10. Vitamins.

1. Reports were received from David P. Barr, New York; Harry Beckman, Milwaukee; Henry A. Christian, Boston; Arthur C. DeGraff, New York; Harry Gold, New York; Frederic M. Hanes, Durham, N. C.; Tinsley R. Harrison, Dallas, Texas; Ernest E. Irons, Chicago; Chester S. Keefer, Boston; Stuart Mudd, Philadelphia; J. H. Musser, New Orleans; O. H. Perry Pepper, Philadelphia; Hobart A. Reimann, Philadelphia; Austin E. Smith, Chicago; Torald Sollmann, Cleveland, and W. O. Thompson, Chicago.

Physicians of long experience will arise at once to defend iron, iodine, alcohol, mercury and even aspirin. Actually the choice of the most important remedy depends on the condition with which the physician is confronted. For malaria there is no question about the value of quinine or quinacrine; for asthma, epinephrine or aminophylline would seem most important. For amebic dysentery emetine, chiniofon or carbarsone would be the choice. If the patient just happened to have postprandial indigestion, baking soda might be considered the sovereign remedy. One of the experts put common table salt as number 4 on his list and glucose as number 5.

So great then has been the advancement of therapy that the choice of the ten most important remedies in medicine would baffle any assemblage of experts. The physical therapists might well question the entire list. The surgeons and authorities in the field of cancer would have ideas seriously varying from those of the internists. All physicians may well take great pride in all that medicine has accomplished in the past quarter century!

COLLOIDAL PENICILLIN

Penicillin injected intramuscularly or intravenously is rapidly excreted in the urine, an effective therapeutic level in the blood stream rarely being maintained for as long as two hours after injection. In order to prolong the effective concentration in the blood clinicians repeat the intramuscular or intravenous dose at three to four hour intervals or resort to some method of continuous instillation.[1] Several alternate methods of prolonging penicillin action have been suggested by recent experimenters, such as the simultaneous injection of diodrast[2] or para-aminohippuric acid,[3] both of which retard the rate of renal excretion of penicillin. Others have suggested suspending the intramuscular dose in oil or in oil containing 0.75 to 6 per cent of beeswax[4] or of reducing the rate of local absorption by prolonged chilling of the injected muscle[5] or by adding epinephrine to the penicillin dose.[6] Two of these methods have apparently given encouraging clinical results, particularly in the treatment of gonorrhea.

What may prove to be an equally successful method has been suggested by Chow and McKee[7] of the Squibb Institute for Medical Research, New Brunswick, N. J. They combined crystalline penicillin with human plasma protein to make a large penicillin-protein complex. This colloid is apparently much more slowly absorbed from the injected muscle and more slowly excreted by the kidneys than is free or unbound penicillin. To make such a combination, 125 units of penicillin per cubic centimeter was added to buffered solutions of human alpha, beta or gamma globulin or to human serum albumin. The mixture was placed in a cellophane bag suspended in phosphate buffer solution. After eighteen to twenty-four hours continuous rocking, the relative penicillin titer was determined in the bag and the surrounding dialysate. Within the limits of the experimental error there was no evidence of a union between penicillin and any of the globulins. Approximately two thirds of the penicillin in the albumin mixture became nondialysable, presumably as a result of physical or chemical union with albumin molecules.

The resulting penicillin-albumin complex was then isolated in a state of at least partial purity by repeated precipitation with 50 per cent alcohol; unbound penicillin is soluble in this concentration. A dry powder was obtained by lyophylization. Unlike the sulfonamide-albumin complex, which is devoid of bacteriostatic properties,[8] the penicillin-albumin complex possesses full antibiotic powers. Injected intramuscularly into mice, the complex is much more slowly excreted in the urine than unbound penicillin. Since the protein in this complex is normal human albumin, Chow predicts that the penicillin-protein complex will be found to be nontoxic and nonantigenic for man. The therapeutic efficiency of the new colloidal penicillin is now under investigation.

1. The Indications, Contraindications, Mode of Administration and Dosage of Penicillin, War Production Board, Civilian Penicillin Distribution Unit, 226 West Jackson Boulevard, Chicago, Dec. 1, 1944.
2. Rammelkamp, C. H., and Bradley, S. E.: Proc. Soc. Exper. Biol. & Med. **53**: 29, 1943.
3. Beyer, K. H.; Woodward, R.; Peters, L.; Verwey, W. F., and Mattis, P. A.: Science **100**: 107, 1944.
4. Romansky, M. J., and Rittman, G. E.: Science **100**: 196, 1944.
5. Trumper, M., and Hutter, A. M.: Science **100**: 432, 1944.
6. Fisk, R. T.; Foord, A. G., and Alles, G.: Science **101**: 124, 1945.
7. Chow, B. F., and McKee, C. M.: Science **101**: 67, 1945.
8. Davis, B. D.: J. Clin. Investigation **22**: 753, 1943.

Current Comment

CAMPAIGN TO CHECK AUTOMOBILE BRAKES

The International Association of Chiefs of Police[1] recently announced a campaign of nationwide scope to lead automobile drivers to check their brakes. This program will be conducted between April 15 and June 1. The campaign has been evolved by the police association as a device to focus public attention on the seriousness of the traffic accident situation. When a similar program was started in Michigan one of seven cars failed to meet brake check requirements, and when the program ended only one of twenty-three cars failed to meet such requirements. During the period of the campaign, about 11 per cent of all cars checked had brakes considered inadequate or unsafe. The influence of physicians may well be placed behind this program for its public health importance and as a means of lessening emergency calls in this time of stress.

1. Release from International Association of Chiefs of Police, Safety Division, 20 North Wacker Drive, Chicago 6.

MEDICINE AND THE WAR

ARMY

NO FURTHER REDUCTION IN SIZE OF ARMY MEDICAL CORPS

The Office of the Surgeon General has advised that its recent action as approved by War Department directive of releasing a few medical corps officers to bring the strength of the corps within the allotted ceiling (THE JOURNAL, Dec. 30, 1944) has been completed. At the present time the strength of the medical corps is within reasonable conformity with the troop basis of the Army, and no further reduction is contemplated until such time as overall planning now in process concerning the projected needs for medical care of the Army can be ascertained and a reduction of medical corps officers made in the same proportion.

Medical Corps officers who will enter on active duty after completing the Army Specialized Training Program in medicine and a suitable internship will during the coming months be used largely to replace those Medical Corps officers who are lost to the service.

ARMY PREVENTIVE MEDICINE OFFICERS MEET

A three day conference of army preventive medicine officers was recently held at the School of Hygiene and Public Health, Baltimore, and was attended by representatives from the Office of the Surgeon General, service commands, army air forces and army ground forces. The purpose of the conference was to present recent developments in research and current policies and to afford ample opportunity for discussion of local preventive medicine problems and their solutions. The conference was opened by Major Gen. Philip Hays, commanding general of the Third Service Command. Topics discussed the first day were immunization, control of infectious diseases and insect control. The presiding officer was Col. Thomas B. Turner, assistant chief, Preventive Medicine Service, Office of the Surgeon General. Topics discussed the second day were problems of sanitary engineering, industrial medicine in the Army, public health aspects of tropical diseases, laboratory services and army veterinary activities. The presiding officer was Col. W. A. Hardenbergh, director of the Sanitary Engineering Division, Preventive Medicine Service, Office of the Surgeon General. Topics discussed the third day were venereal disease control, nutrition in troops, health programs in occupied countries, foreign quarantine in military traffic and medical intelligence. The presiding officer was Lieut. Col. Elliott S. Robinson, assistant chief, Preventive Medicine Service, Office of the Surgeon General.

ARMY HOSPITALS SEEK OCCUPATIONAL THERAPISTS

A serious shortage of occupational therapists, who play a vital role in the reconditioning of sick and wounded soldiers, exists in army hospitals, in addition to the lack of nurses and trained medical technicians. The Office of the Surgeon General reported that of the 1,800 qualified registered occupational therapists in the country the Army has only 225 and has immediate need for another 225. Openings exist in all parts of the country for this highly important work. Applicants who are employed on a civilian status must be graduates of a course in occupational therapy approved by the Council on Medical Education and Hospitals of the American Medical Association or must be a registered occupational therapist. The approved course has a minimum requirement of at least four years in an approved college. The Civil Service classification is subprofessional 5 and the pay is $1,800 a year, plus overtime. Applications for employment should be made directly to the Office of the Surgeon General, Washington, D. C., and application forms are obtainable at any post office.

MISSING IN ACTION

Capt. John S. Rodda, formerly of Portland, Ore., has been reported missing in action since Dec. 19, 1944, at which time he was in action in Belgium. Dr. Rodda has been almost constantly in forward and very active areas ever since his D day landing in Normandy with the glider units which followed the parachutists in ahead of the beach landings. He participated in the Presidential citation of his unit for this work and received the Purple Heart because of injuries received when his flak damaged glider crashed. Dr. Rodda graduated from the University of Oregon Medical School, Portland, in 1940 and entered the service July 25, 1941.

Major G. D. Fridline, formerly of Ashland, Ohio, has been reported missing in action since Dec. 21, 1944. Dr. Fridline graduated from Boston University School of Medicine in 1931 and entered the service in October 1940 as commanding officer of Company H, 112th Medical Regiment, Ohio National Guard, and was later assigned to the medical detachment of the 166th Infantry.

Capt. Charles F. Payton, formerly of Birmingham, Mich., has been reported missing in action on the Belgian-German front since January 20. He was stationed at front line first aid stations during much of the fierce fighting of the Belgian bulge. Dr. Payton graduated from the University of Michigan Medical School, Ann Arbor, in 1942 and entered the service Oct. 7, 1943.

TRAINING OFFICERS FOR THE ARMY MEDICAL CORPS

Courses of instruction in internal medicine and medical specialties and in general surgery and surgical specialties which are being set up in army service forces general and certain regional hospitals for army officers will be discontinued at the Mayo Foundation with the completion of the present quarters, according to an announcement at the Office of the Surgeon General.

Officers of the Army Medical Corps will continue in the Mayo Foundation their training in anesthesia, physical medicine and clinical roentgenology according to the usual schedule that has been in operation in these courses.

Courses in maxillofacial and plastic surgery and in other special fields for individual officers will be continued at the Mayo Foundation as requested by the Army or Navy. Over 1,200 officers have participated in the several courses in the Mayo Foundation since they were inaugurated in January 1942. These courses were organized on the assumption that during a twelve weeks period a sufficiently comprehensive review of the general fields of medicine and surgery could be accomplished to conform to the varied needs, experiences and training of the officers.

Following the war it is planned that facilities of the Mayo Clinic will again be utilized for courses on a basis similar to those conducted during the past three years for physicians being detached from military service and for civilian physicians.

WACS TO BE NURSE'S AIDES

As the result of plans to enlist medical Wacs, the recruiting of full time remunerated nurse's aides has been stopped by a War Department directive. Aides already in the service or now undergoing training will be retained. Because of the difficulty of transferring these civilians away from home and home responsibilities, the new plan has been adopted in the knowledge that medical Wacs can be transferred readily to places where there may be an acute shortage of nurses.

The drive has been started to enlist 8,000 Wacs, many of whom are expected to carry on nonprofessional medical work in army hospitals. To help nurses of the Regular Army, 100 medical Wacs are now being assigned to each army hospital.

ARMY NURSE CORPS NEEDS 16,000 NURSES IMMEDIATELY

Major Gen. George F. Lull, Deputy Surgeon General, recently announced that the Army needs 16,000 additional nurses immediately in order to care adequately for wounded and sick American soldiers. Hospital units have been shipped overseas without nurses because of the shortage, which meant that overseas nursing personnel, already overtaxed, had to be drawn on to staff these units. Of the Army Nurse Corps strength of 44,000, about 71 per cent are overseas, some having been in foreign theaters for several years. When the full quota of 60,000 is reached it will be possible to make more effective a rotation plan that will provide much needed change for the overworked nurses who have been away from home for long periods.

AMPUTATION CASES IN THE U. S. ARMY

In a recent report from the Office of the Surgeon General, it is stated that amputation cases in the United States Army reached a total of 6,027 as of January 1945, including 1 triplicate case, the first known in either this war or the first world war. There are no "basket" cases, the term used to denote loss of all four limbs, nor were any reported during the entire course of the first world war.

In the first world war there was a total of 4,403 amputation cases. Of the 6,027 cases in this war, 331 represent double amputations, that is, loss of two limbs. The remainder, or 5,695, are soldiers with one arm or one leg lost. Of the total number, approximately 2,000 cases have been treated at one of the six army general hospitals specializing in amputation cases and returned to civilian life. The hospitals include Walter Reed General Hospital, Washington, D. C.; Lawson General Hospital, Atlanta, Ga.; Percy Jones General Hospital, Battle Creek, Mich.; England General Hospital, Atlantic City, N. J.; McCloskey General Hospital, Temple, Texas, and Bushnell General Hospital, Brigham City, Utah.

Before discharge, each man is individually fitted with a custom made prosthesis and taught complete use of his artificial limb. Only when he is able to care for himself and take his place in the civilian world is he released from army jurisdiction and medical care.

LIEUT. REBA Z. WHITTLE A PRISONER OF WAR

Lieut. Reba Z. Whittle, formerly of Rock Springs, Texas, has chosen to remain in a German prison camp at Stalag 9 C near Meiningen to care for wounded American prisoners of war, although she is eligible for repatriation. It was reported that when the Germans learned that she was "protected personnel," according to the terms of the Geneva convention, she was given the opportunity to be released. She realized, however, that the wounded American prisoners needed nursing care and she offered to remain to take care of them. Her offer was accepted and she is now a prisoner of war. It is believed that Lieutenant Whittle is the only army nurse who is a prisoner of war in Germany.

COLONEL DUNCAN NEW CONSULTANT

Col. G. G. Duncan, formerly chief of the Medical Service at Thomas M. England General Hospital, Atlantic City, has been assigned as consultant in medicine, Headquarters, Second Service Command, Governors Island, N. Y. He replaced Lieut. Col. Herman Blumgart, who has been assigned overseas.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

REVISE SELECTIVE SERVICE DEFERMENT POLICY

The National Headquarters of Selective Service, in an amendment of Local Board Memorandum No. 115, has revised the procedures relative to the deferment of men under 38 years of age and has designated the Procurement and Assignment Service as one of the fifteen certifying agencies, with the Code No. 15. These procedures will affect (*a*) civilian interns, (*b*) civilian residents, (*c*) members of the professions on the faculties of universities and (*d*) members of the professions engaged in private practice or otherwise regularly engaged in an activity in war production or in support of the national health, safety or interest.

MEMBERS OF THE PROFESSIONS IN THE AGE GROUP 18 THROUGH 29

A. It is necessary at once for state chairmen to ask employers (universities, hospitals, industries and so on) to make out and submit to the state chairman's office a list, in triplicate, of members of the professions in his establishment who are in the age group 18 through 29 and who are necessary to and regularly engaged in and are indispensable and irreplaceable in an activity in war production or in support of the national health, safety or interest. This includes all those who were on Jan. 1, 1945 classified II-A or II-B. Two sets of three copies each of form 42-A (special-revised) should be submitted for each registrant.

B. Immediately on receipt of forms 42-A (special-revised) the state chairman should, if he concurs that the registrant is essential, (1) certify by signing the originals only and entering the name and Code No. 15 of the Procurement and Assignment Service as the certifying agency; (2) forward one complete set of three copies each of form 42-A (special-revised) to the registrant's local board; (3) forward to the state director of Selective Service in the state of employment the original copy of the second sheet of 42-A (special-revised), with one copy of the lists, and (4) retain, for his own use, two carbon copies of form 42-A (special-revised) and the two copies of the lists.

MEMBERS OF THE PROFESSIONS IN THE AGE GROUP 30 THROUGH 33

The same procedure as outlined in A and B will be followed by members of the professions in the age group 30 through 33, with the exception that forms 42 and 42-A will be used in place of form 42-A (special-revised). Members of the professions in the age group 30 through 33 must be necessary to and regularly engaged in (but not necessarily indispensable and irreplaceable in) an activity in war production or in support of the national health, safety or interest.

MEMBERS OF THE PROFESSIONS IN THE AGE GROUP 34 THROUGH 37

The same procedures as outlined in A and B will be followed for members of the professions in the age group 34 through 37, with the exception that forms 42 and 42-A will be used in place of forms 42-A (special-revised). Members of the professions in the age group 34 through 37 must be regularly engaged in (but neither necessary to nor indispensable and irreplaceable in) an activity in war production or in the support of the national health, safety or interest.

N. B.: 1. The term "interns" as used includes all individuals serving in internships whether or not they have received their degree of doctor of medicine.

2. These procedures are not necessary for individuals who are classified by Selective Service as 4-F. However, this must not be confused with a physical disqualification on application for commission, which is an entirely different thing.

3. Students are not included in these procedures.

Hospitals and other institutions employing civilian physicians under 38 years old are urged to submit to the state chairman of the Procurement and Assignment Service the information requested.

NAVY

INTERNSHIPS AND RESIDENCY TYPE GRADUATE TRAINING IN NAVAL HOSPITALS

General rotating internships in naval hospitals were established in 1924. At the present time thirty-eight such hospitals have been approved by the Council on Medical Education and Hospitals of the American Medical Association for internship training on the same standards as those of civilian hospitals.

Under the accelerated program these naval internships consist of a nine months rotating service, providing all interns with three months in each of the three groups of service according to the following schedule:

1. Medicine, neuropsychiatry and clinical laboratory.
2. Surgery, urology, eye, ear, nose and throat and roentgenology.
3. Obstetrics, pediatrics and gynecology.

These internships are acceptable for credit before state boards of licensure to the same extent as similar internships in civilian hospitals.

The Professional Division of the Bureau of Medicine and Surgery, when established last year, began immediately to put into effect an extensive program for graduate medical education of the residency type in naval hospitals. These services are being reviewed by the Council on Medical Education and Hospitals of the American Medical Association for credit before the American boards certifying in the specialties and the American College of Physicians, while the facilities for surgical residencies are also being surveyed by the American College of Surgeons.

Younger medical officers whose graduate training in the specialties may have been interrupted by enlistment may thus continue their training in the formal equivalent of a residency when assigned to the special divisions of these hospitals. The general policy of the Bureau of Medicine and Surgery with regard to opportunities for graduate training in the medical specialties is to be a gradual substitution of this residency type of clinical training through duty assignments in place of the shorter and more didactic or academic "courses" which have long been available. Medical officers desiring graduate training in the specialties, especially if already partly trained, are encouraged to apply to the Bureau of Medicine and Surgery for such assignments on completion of their tours of sea duty. All of the specialties are included in this training because the Navy cares not only for naval personnel but also as far as possible for their dependents, including large numbers of obstetric, gynecologic and pediatric cases.

This program was not an innovation except as an officially recognized procedure. The inclusion of many prominent specialists in the staffs of the large naval hospitals of this country had contributed to the existing high standards of care of patients as well as providing additional opportunities for graduate work for medical officers even prior to the initiation of this formal residency program last year. Appropriate assignment of medical officers according to previous training with opportunities for further training in their chosen specialties is designed primarily to ensure constant improvement in the standards of medical care in naval activities.

NAVY AWARDS AND COMMENDATIONS

Lieutenant Commander George A. Stanbery

The Silver Star Medal was recently awarded to Lieut. Comdr. George A. Stanbery, formerly of Vandalia, Ill., "for conspicuous gallantry and intrepidity while serving as battalion medical officer with the Second Amphibian Tractor Battalion, Second Marine Division, during action against enemy Japanese forces on Tarawa Atoll, Gilbert Islands, Nov. 21-23, 1943. Realizing the urgent need for medical assistance ashore on the morning of November 21, Lieutenant Commander Stanbery personally assumed command of his landing boat and ordered it to land despite the intense, persistent machine gun and anti-boat fire which was driving all small craft back from the beach. On landing, he immediately joined a hard pressed aid station and, working tirelessly and with complete disregard for his own safety, continually exposed himself to enemy fire in order to evacuate seriously wounded casualties onto amphibian tractors. By his splendid initiative and outstanding professional skill, Lieutenant Commander Stanbery was responsible for the saving of many lives, and his courageous efforts under extremely hazardous conditions were in keeping with the highest traditions of the United States Naval Service." Dr. Stanbery graduated from St. Louis University School of Medicine in 1927 and entered the service March 23, 1942.

Lieutenant Marion Melvin Green

The Legion of Merit was recently awarded to Lieut. Marion Melvin Green, formerly of Stockton, Calif., "for exceptionally meritorious conduct in the performance of outstanding services to the government of the United States as a medical officer prior to and during the operations against enemy Japanese forces on Tarawa Atoll, Gilbert Islands, Nov. 20 to 24, 1943. Assuming the duties of the battalion surgeon, who had been killed, Lieutenant Green efficiently and expeditiously established an aid station on one of the assault beaches and, completely disregarding his own personal safety, worked tirelessly and with expert professional skill in administering medical assistance and evacuating the wounded. By his splendid initiative, cool courage and tenacious devotion to duty under extremely hazardous conditions, Lieutenant Green undoubtedly saved the lives of many who otherwise might have perished." Dr. Green graduated from Stanford University School of Medicine, San Francisco, in 1933 and entered the service in March 1942.

Lieutenant Ralph Atkins Foster

The Silver Star Medal was recently presented to Lieut. Ralph Atkins Foster, formerly of Yakima, Wash., "for conspicuous gallantry and intrepidity while serving with a Marine raider battalion during an engagement with enemy Japanese forces on Bougainville Island, Solomon Islands, Nov. 1, 1943. Landing on the beach among the first assault waves, Lieutenant (then Lieutenant, Junior Grade) Foster immediately went to the aid of men wounded by a hostile artillery shell which exploded in their landing craft. In full view of the enemy he worked tirelessly for more than an hour, caring for the injured while the Japanese kept up a continuous fire and grenades struck within 10 yards of his post. With utter disregard for his own safety he steadfastly remained in his hazardous position until he had treated all of the wounded, thereby contributing to the saving of many lives which otherwise might have been lost. His cool courage, outstanding professional skill and unswerving devotion to duty were in keeping with the highest traditions of the United States Naval Service." Dr. Foster graduated from the University of Oregon Medical School, Portland, in 1938 and entered the service Nov. 15, 1942.

Lieutenant Commander Robert L. Griffith

For exceptional efficiency as senior medical officer in directing his medical staff aboard an attack transport during the capture of Japanese held Saipan and Tinian Islands, the Bronze Star was recently awarded to Lieut. Comdr. Robert L. Griffith of the Public Health Service of the Federal Security Agency. The citation read that, "working zealously with the limited facilities available, Lieutenant Commander Griffith was responsible for the prompt and skilled treatment of more than a thousand casualties taken aboard during the combined operations. His exceptional efficiency in directing his medical staff throughout long hours without rest was a contributing factor in saving the lives of men wounded in combat and reflects the greatest credit on the high professional integrity of Commander Griffith and his gallant devotion to the fulfilment of a vital mission." Dr. Griffith graduated from Harvard Medical School, Boston, in 1936. He received a commission as assistant surgeon in the regular corps of the Public Health Service in 1939. Prior to his assignment to the overseas theater of war with the U. S. Coast Guard, Dr. Griffith was stationed at the Marine Hospital, New Orleans.

MISCELLANEOUS

IMMUNE SERUM GLOBULIN

Immune serum globulin (gamma globulin) for the prophylaxis, modification and treatment of measles is now available for the civilian population through an appropriation by the American Red Cross as announced by Mr. Basil O'Connor, chairman of the Central Committee of the American Red Cross. This action is in keeping with the policy of the American Red Cross to return to the American people, as far as practicable, any useful blood derivatives accumulated in excess of military needs as a result of its blood donor program.

The serum globulin will be supplied without charge to state and territorial health departments or local health departments where biologic products are not supplied by the state, provided the globulin will be distributed without charge to physicians, hospitals and clinics, and provided it will be administered in accordance with established standards and without any charge to the patient for the globulin.

As announced in the July 1, 1944 issue of THE JOURNAL, health departments assumed the costs of processing and distributing immune serum globulin. Under the new plan the entire cost of processing and distributing the product is now borne by the American Red Cross.

The crude serum globulin fraction thus made available is derived as a by-product from processing serum albumin under Navy control. It has been declared surplus and assigned by the Navy to the American Red Cross for distribution.

Eligible health agencies are being requested to place their orders promptly with National Headquarters, American Red Cross, Washington, D. C., attention of Dr. G. Foard McGinnes, National Medical Director.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

California

Birmingham General Hospital, Van Nuys: Chemotherapy, Dr. Clinton Thienes and Lieut. Comdr. Charles Bingham, March 14.

U. S. Naval Air Training Station, San Diego: Internal Derangements of the Knee Joint, Dr. John Wilson, March 16.

Station Hospital, Camp Cooke: Fractures About the Wrist and Ankle, Lieut. Col. Richard B. McGovney and Dr. Samuel Mathews, March 21.

Hoff General Hospital, Santa Barbara: Fractures About the Wrist and Ankle, Lieut. Col. Richard B. McGovney and Dr. Samuel Mathews, March 21.

U. S. Naval Hospital, Oceanside: Thoracic Surgery, Dr. John Jones and Lieut. Comdr. J. E. Dailey, March 22.

Illinois

Gardiner General Hospital, Chicago: Dermatologic Diseases, Drs. Stephen Rothman and E. A. Oliver, March 14; Sequelae of Head Injuries, Dr. Paul Bucy, March 23; Burns and Plastic Surgery, Drs. Wayne B. Slaughter and Paul Hausmann, March 28.

Station Hospital, Fort Sheridan: Malignancies in the Army Age Group—Medical X-Ray and Surgical Diagnosis and Treatment, Drs. Alexander Brunschwig and James P. Simonds, March 15; Endocrinology, Dr. Willard O. Thompson, March 29.

Vaughan General Hospital, Hines: Wound Healing and Tendon Surgery, Drs. Hilger P. Jenkins and Alfred Rasmussen, March 14; Mental Hygiene and the Prevention of Neuroses in War, Capt. Charles O. Sturdevant, March 28.

U. S. Naval Hospital, Great Lakes: The Safety of Primary Resection of the Colon, with a Discussion of the Preoperative and Postoperative Management, Dr. Karl A. Meyer, March 20.

Mayo General Hospital, Galesburg: Virus and Rickettsial Diseases—Medical and Neurologic Diseases and Treatment, Drs. Francis Gordon and J. E. Salk, March 14; Psychosomatic Medicine, Dr. Francis J. Gerty, March 28.

Station Hospital, Camp Ellis: Thrombosis, Thrombophlebitis and Anticoagulants in Less Common Peripheral Vascular Diseases, Drs. Geza de Takats and Armand J. Quick, March 14; Peptic Ulcer, Gallbladder and Liver Diseases, Drs. Lowell D. Snorf and John T. Reynolds, March 28.

Regional Hospital, Chanute Field, Rantoul: Laboratory Diagnosis and Its Relationship to Medical and Surgical Treatment, Drs. Steven O. Schwartz and William S. Hoffman, March 14; High Blood Pressure, Drs. Adrien H. Verbrugghen and Louis N. Katz, March 28.

Indiana

Billings General Hospital, Fort Benjamin Harrison: Brain and Spinal Cord Injuries, Drs. J. K. Berman and Robert L. Glass, March 14; Conditions Affecting Glucose Metabolism, Drs. Franklin B. Peck and C. L. Rudesill, March 28.

Wakeman General Hospital, Camp Atterbury: Plexus and Peripheral Nerve Injuries, Capt. Irving J. Spiegel, March 14; Diseases of the Intestinal Tract, Medical and Surgical Diagnosis and Care, Drs. William Foster Montgomery and Rollin H. Moser, March 28.

Ohio

A. A. F. Regional Station Hospital, Patterson Field, Fairfield, Ohio: The Diagnosis and Treatment of the Common Arthritides, Dr. Russell Haden, March 21.

Crile General Hospital, Cleveland: Problems in the Diagnosis and Management of Coronary Artery Disease, Dr. R. W. Scott, March 27.

Virginia

Woodrow Wilson General Hospital, Staunton: Infectious Hepatitis, Col. Marian H. Baker, March 14; Relation of Dental Focal Infection to Disease, Lieut. George L. Vandewall, March 28.

Wisconsin

Station Hospital, Camp McCoy: Head and Spine Injuries, Dr. Theodore C. Erickson, March 14; Allergic States, Dr. Theodore L. Squier, March 28.

Station Hospital, Truax Field: Arthritis, Dr. Milton C. Borman, March 14; Peripheral Vascular Diseases, Dr. Geza de Takats, March 28.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, February 24, page 467)

COLORADO

St. Anthony Hospital, Denver. Capacity, 230; admissions, 6,602. Sister M. Mechtildis, R.N., Superintendent (2 interns).

GEORGIA

Emory University Hospital, Emory University. Capacity, 267; admissions, 8,064. Dr. R. M. Paty Jr., Medical Director (resident—medicine, July 1, disqualified for military service).

ILLINOIS

St. Elizabeth Hospital, Chicago. Capacity, 342; admissions, 8,180. Sister M. Vetusa, R.N., Superintendent (interns).

Women and Children's Hospital, Chicago. Capacity, 155; admissions, 3,538. Mrs. Edna Nelson, R.N., Superintendent (woman intern, now).

INDIANA

St. Catherine Hospital, East Chicago. Capacity, 324; admissions, 6,894. Sister M. Cordula, R.N., Superior (3 interns, July 1).

NEBRASKA

St. Elizabeth Hospital, Lincoln. Capacity, 230; admissions, 6,433. Dr. Arthur L. Smith, Medical Director (interns).

NEW YORK

Lincoln Hospital, New York. Capacity, 469; admissions, 9,546. Dr. Herman E. Bauer, Medical Superintendent (4 interns, July 1).

OHIO

Jewish Hospital, Cincinnati. Capacity, 300; admissions, 7,906. Mr. Van C. Adams, Superintendent (resident—surgery, July 1, disqualified for military service).

Lakewood Hospital, Lakewood. Capacity, 157; admissions, 4,276. Dr. R. B. Crawford, Superintendent (interns).

St. Rita's Hospital, Lima. Capacity, 185; admissions, 5,640. Sister Mary Aquin, R.N., Superintendent (intern, July 1).

Riverside Hospital, Toledo. Capacity, 188; admissions, 4,286. Mr. Norman L. Losh, Director (2 interns, 1 resident, disqualified for military service).

ORGANIZATION SECTION

DEFERMENT OF MEDICAL AND PREMEDICAL STUDENTS

The following bill, S. 637, was introduced February 26 in the Senate of the United States by Mr. Ellender and referred to the Committee on Military Affairs:

A Bill

To authorize the release of persons from active military service, and the deferment of persons from military service, in order to aid in making possible the education and training of physicians and dentists to meet essential needs.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, to the extent that the President deems to be (1) feasible, (2) compatible with military operations, and (3) necessary or desirable in order to make possible the education and training as physicians and dentists of as many persons as are necessary to provide the minimum number of medical doctors and dentists required to meet the essential needs of the civilian population (especially in rural areas) and the armed forces for medical and dental services in the future, the President is authorized to provide for the release from active duty in the armed forces of men who have completed more than one year of honorable service in such forces during the present war and who have satisfactorily completed a substantial portion of the medical, dental, premedical or predental education and training necessary to qualify them as physicians or dentists, in order to enable such persons to pursue further such education and training. The release of any person from active duty for the purposes of this section may be conditioned upon his acceptance by an accredited school and the pursuit of such education and training in a satisfactory manner.

SEC. 2. Section 5 of the Selective Training and Service Act of 1940, as amended, is hereby amended by adding at the end thereof the following new subsection:

"(n) In order to make possible the education and training as physicians or dentists of as many persons as are necessary to provide the minimum number of medical doctors and dentists required to meet the essential needs of the civilian population (especially in rural areas) and the armed forces for medical or dental services in the future, the President shall, under such rules and regulations as he may prescribe, provide for the deferment from training and service under this act in the land and naval forces of the United States of those men who are found in accordance with section 10 (a) (2) to be enrolled in the national medical and dental education program. The President shall provide for the enrolment, under such rules and regulations as he may prescribe, in a national medical and dental education program (hereinafter referred to as the "program") of such persons as he deems necessary to be enrolled in such program, in order that they may be deferred under this subsection from training and service under this act, subject to the following limitations:

"(1) (A) The number of men enrolled in the program for the purpose of permitting them to pursue first year premedical education and training shall not exceed eight thousand at any one time.

"(B) The number of men enrolled in the program for the purpose of permitting them to pursue first year predental education and training shall not exceed three thousand and five hundred at any one time.

"(2) (A) The number of men enrolled in the program for the purpose of permitting them to pursue second year premedical education and training shall not exceed eight thousand at any one time prior to the end of the third month of the academic year and shall not exceed four thousand five hundred at any one time after the end of the third month of the academic year, and after the end of such third month shall not include any one who has not been accepted for admission to the earliest subsequent entering class of an accredited medical school following the satisfactory completion of such second year premedical education and training.

"(B) The number of men enrolled in the program for the purpose of permitting them to pursue second year predental education and training shall not exceed three thousand five hundred at any one time prior to the end of the third month of the academic year and shall not exceed one thousand seven hundred and fifty at any one time after the end of the third month of the academic year, and after the end of such third month shall not include any one who has not been accepted for admission to the earliest subsequent entering class of an accredited dental school following the satisfactory completion of such second year predental education and training.

"(3) No man shall be enrolled in the program for the purpose of permitting him to pursue premedical or predental education and training for more than two years.

"(4) (A) The number of men enrolled in the program for the purpose of permitting them to pursue first year, second year, third year or fourth year medical education and training shall not exceed four thousand five hundred in each of such classes at any one time.

"(B) The number of men enrolled in the program for the purpose of permitting them to pursue first year, second year, third year or fourth year dental education and training shall not exceed one thousand seven hundred and fifty in each of such classes at any one time."

In determining the number of men who may be enrolled in the program, the President shall take into consideration and make due allowances for the number of physicians or dentists who may be obtained through the education and training of other persons not enrolled in the program, including veterans of the armed forces, women and persons not qualified for military service. The limitation on the number of men who may be enrolled in the program shall not be deemed to be a limitation on the total number of students who may be enrolled in medical, dental, premedical or predental schools but shall be deemed to be a limitation only on the number of men who may be deferred under this subsection who shall be in addition to students who may be obtained from other sources. Persons shall not be enrolled in the program for the purpose of permitting them to pursue medical or dental education and training at any schools except medical and dental schools whose graduates are acceptable to the armed forces for commissioning as medical doctors or dentists. The number of men who may be enrolled in the program for the purpose of permitting them to pursue each of the two respective years of premedical or predental education and training shall be allocated by the President among the several states on the basis of population, as determined by the 1940 census. The men to be enrolled in the program from each state for the purpose of permitting them to pursue such education and training shall be selected from among applicants within such state, in such manner as the President may prescribe. In making such selections, representatives of accredited schools which offer full time medical, dental, premedical or predental courses of instruction shall be consulted and their services may be utilized. No man who fails to make satisfactory progress in pursuing his education and training shall be permitted to continue to be enrolled in the program.

Council on Medical Service and Public Relations

THE ATLANTA CONFERENCE

Senator Claude Pepper of Florida was the guest and principal speaker at the fourth regional conference of the Council on Medical Service and Public Relations, which was held at Atlanta, Ga., February 23. Representatives from Alabama, Georgia, Mississippi, North Carolina, South Carolina and Tennessee attended the conference. The delegates from Florida and Louisiana were unable to be present.

Senator Pepper, who was in Atlanta attending another meeting but took time to address the conference, was introduced by Dr. James E. Paullin, Past President of the American Medical Association and a member of the Council. "I have explained to Senator Pepper that this is a conference composed of men who are extremely interested in the problems of health and medical care and that we greatly appreciate having Senator Pepper, who is likewise interested in these problems, as our guest" Dr. Paullin said as conference chairman.

Senator Pepper's Remarks

Our committee was authorized by a senate resolution to constitute itself as a Subcommittee on Education and Labor. Not only was the committee recently reconstituted by a Senate resolution but Senator Murray, chairman of the full committee in which all health matters appear, set up a subcommittee to work on all problems pertaining to health. I recommended to Senator Murray that we enlarge our special committee to include nine altogether. The one first set up consisted of Democrats Thomas of Utah, Tunnell of Delaware and myself as chairman. The other members are Republican Wherry of Nebraska and a Progressive, La Follette of Wisconsin. Recently Senator Wherry requested to be permitted to resign from the committee. Replacing him was Republican Smith of New Jersey. I recommended to Senator Murray that he add four more senators. Now he appointed himself, Senator Murray of Montana and Senator Hill of Alabama, co-author of the hospital bill sponsored by the Hospital Association, hearings on which are to begin next Monday. Then two Republicans were added, Senator Taft of Ohio and Senator Aiken of Vermont. The committee now consists of Five Democrats, three Republicans and one Progressive, La Follette of Wisconsin. I recommended to Senator Murray that he appoint the same Senators as were on the special Senate committee, which has a small amount of funds and power to carry on investigations, and that the same be named a permanent Senate committee. We have recently obtained from Senator George permission to enlarge our inquiry and let this committee cover the field of the health of veterans and health facilities rendered by veterans. Senator George, of course reserving the right to legislate on his Committee on Finance, gave us permission to go ahead with our study and to publish the report which we have already prepared. This will be published on February 26 as an inquiry into the health of veterans. When I started into this subject, some thought it was an effort on the part of Pepper of Florida to inflict socialized medicine on the country. I reiterate that I have never favored socialized medicine. I live in the field of politics and am not angry with any of my doctor friends who misinterpreted my views. I have no desire to impair the integrity of the profession or the right of the patient to make a free choice of doctor, dentist or nurse or anything else we think of as Americanism. I think we are making real progress in this field. I am very happy to say that when our report was published the first person to contact me was Dr. Fishbein. He wrote me a letter commending the report, published it in full in THE JOURNAL and wrote an editorial complimenting the work and the report. From all over the country, if I may say so, we have had generous and considerate comments. The other night in New York we had a discussion of public health and we had a forum on the New York *Times*. Michael Davis, Kingsley Roberts, Kaempffert, Fishbein and I discussed the subject. Before that time Dr. Fishbein and I had luncheon. A few days ago Dr. A. W. Richards, whom you will know as a member of the Committee on Medical Research of the National Research Council, and Dr. Palmer from New York, working on a report under Dr. Richards, were in contact with me. Whenever I could I have urged representatives of medical associations to be present. We have pleasant contact with foundations interested in research, and many individuals like Mr. Albert Lasker and others have been working with us. I believe it is not unfair to say that for the first time we have a Congressional committee which is in a position to be a coordinating committee, and we should get something constructive from it.

Dr. Vannevar Bush is making a study under the direction of the President on the question of continuation of publicly financed medical research. The President has said that as soon as the report is ready it will be made available to us and other Congressional groups interested in it. Dr. Fishbein and Dr. Lewis Weed the other day agreed that there was no reason why we could not all get together in agreement as to where funds will be given out. Drs. Palmer, Richards and others are trying to work out something that the President will consider; some sort of agency properly constituted, a certain number of doctors, professors, foundation people, public men and chemists; at least some sort of an agency to allocate a sizable amount of public money to the encouragement of medical research wherever such encouragement may be given. We don't want to load the committee down with research not properly related to medical research. It should be concerned only with those things scientifically and directly connected with public health. There is no reason why even in the next few weeks, certainly the next few months, we may not be able to get together the profession, various agencies and the President on a medical research program, or at least on personnel who will aid a program or with the provision of money to give aid to such a program.

The Committee on Education and Labor, of which I am a member, will start hearings on the Hill-Burton bill for the construction of a national system of hospital facilities. Generally speaking, it follows the plan proposed by Surgeon General Parran and evolving over the past several years, namely to have what might be called a health center in rural areas, rural hospitals, of course more complete than health centers, district hospitals and then a base hospital, not only a hospital but a teaching place as well. My subcommittee will take the bill as soon as the hearings are finished and study it and make such amendments as we think proper. We may recommend additional hearings and extend it a few days.

The next great field is the provision of additional medical (including dental) personnel. I think we are agreed that we should give adequate dental service to the people. Dental service is now available to 30 per cent. It should be given to 90 or 95 per cent. That will take more dentists. It will give more honorable occupation to men and boys and girls in the country. More technical schools are needed, and the rendition of more services may be the solution of employment of people. If we give people in the country the medical care which they should have the number of the profession will be too small. At least we may give a doctor enough leisure to do as he wishes and also make it possible to restrict his activity as he grows older to what he wants to do. We have in our report recommended that there should be scholarships or loans for people qualified to get medical education. We are not trying to lower medical standards; we are trying to raise them. I am a person of vocational training; others should be. We worked in power plants, waited on tables and the like and borrowed money from the loan foundation. I would not be grateful if I did not try to open the doors of opportunity to more who have aptitudes and who would render service. We don't want to flood the medical profession with too many doctors. If any one wants to establish an overall figure which we should not exceed I would not want to go beyond that. I do think we can aid boys and girls who have aptitudes for the profession to get into the profession by scholarships and loan funds. Women should be admitted to professions on equality with men. There is a difference of opinion on this. I think it is a part of our evolutionary concept that women should enter medicine as well as men. But when you get ample hospital facilities, when you get all the doctors, dentists and nurses you need, we must still make the facilities and services available to the American people in a correct way.

That is the problem. And we must do this without lowering standards of the profession. We want to raise the standard, not lower it.

We have the Wagner-Murray-Dingell bill, and that bill contemplates compulsory insurance. It would undoubtedly cover many people and bring them into an insurance scheme and provide vast quantities of funds not now available for these facilities. That is compulsory in character. I am not quarreling with the profession that seems to be against the bill. They feel that the ill of it will exceed the good and we want a directive from this point. Only a few claim that the present system is adequate for every one. My problem is to find the answer between the present systems. There is the feeling that we are to bring conflicting opinions together.

I started off with the idea that first I want to preserve the system of voluntary membership and payment. If you are going to make the program voluntary in character and if it is going to be available to a great amount of persons, payment must be low. Twenty-one per cent of all the American people, of families in the United States, have an annual income of less than $1,000 per family. Twenty-nine per cent of all the families in 1942 had an annual income between one and two thousand dollars. Twenty per cent of all our families had an income between two and three thousand dollars, 20 per cent between three and five thousand dollars, 10 per cent in excess of five thousand dollars. Only 10 per cent have incomes in excess of five thousand dollars. Every one here has more than ten thousand dollars. We all realize how hard it is to get along with our incomes and live according to a decent way of living. You are practicing medicine for a livelihood. I don't think it is put on the doctor to give away his services. I think that if there is going to be a donation, groceries and legal aid should be given too. If you do anything other than that you are bound to charge some one else more or lose out.

I have been thinking in terms of building the hospitals through a plan sponsored by the hospital associations and councils. When we get enough hospitals and doctors I think it should be a plan of insurance to which membership is open on a voluntary basis, each member paying either a fixed amount or a graduated amount according to income. It might be determined by income taxes paid, in order to have some standard. We might have everybody pay a certain amount of money to justify having the same system for the rich and poor alike. The difference between the total receipts of the plan and the total cost of operating the plan would be made up by federal and state subsidies. The disparity in the long run would not be as great as the first way. It is more consistent with our idea that there should be equality between what a man pays and what he can pay. A man paying an income tax on less than $500 would pay say 50 cents a month for each member of his family and himself. A man paying taxes on an annual income as much as one thousand dollars would pay a dollar a month. Next scale on up. We might get on up to where a well to do man would perhaps pay ten dollars a month per person. He might prefer to do it that way rather than go to his own doctor or private hospital. It still preserves the patient's choice of hospital, doctor, nurse to a considerable degree by giving a rich man the right to go to his own doctor and let that doctor turn in his bill to the association. If the association and doctor want to work out a reasonable plan he might charge a little less than he would ordinarily charge. I don't know. I am just thinking out loud. I am thinking of a statewide association operated under the supervision of a statewide council created by a state legislature and appointed by the governor properly constituted. I had in mind the statewide plan, because if you set up a little association down here in the county, sparsely populated, the doctors won't go there and practice. It would be a losing organization. My concept is to make the state the basis. I would like an effective state council with a federal council aiding to work out the necessary arrangements.

What we contemplate is cooperation between state councils and federal councils by which the states are constantly experimenting in this field, working out new technics and always having a certain amount of latitude, maybe constantly recommending to the federal council plans and programs to be worked out and getting federal aid. If you had the state as a basis in setting up insurance schemes, deficiencies between income and disbursement (provision of physical facilities) not part of outlet but just operation costs would be made up by subsidies. You can't do it all at one time. You can't start any of the construction before the end of the war. I don't know what the amount should be. I don't know how it should be graduated. I don't know how to integrate the plan to include Blue Cross schemes and private insurance schemes which insure their workers. I do know that a plan that includes only the worker and not his family is not a good plan.

There must be correlation between civilian and veterans' plans. The veterans' plan has already authorized five hundred million dollars for construction of hospitals. Many believe that the Veterans Administration has not been able to give the best medical service to the veterans. Perhaps not the best doctors have come in, maybe for other reasons. A lot of persons think the Veterans Administration has not given the maximum quality to the veterans. The veterans have generally rested all of their program under one head and treated all their men in veterans' hospitals. But it is a local problem. Many individual men will have to leave their families and go a long ways to get into hospitals. We have committed ourselves to let every veteran go to veterans' hospitals not only for service connected disabilities but for all other services necessary where not able to procure it elsewhere. For all practical purposes the United States government has underwritten medical service and hospital facilities for every American veteran. This will mean before we get through probably fifteen million persons. We got into it because we saw the necessary overlapping of medical and hospital program with the veterans' program. We began to wonder about the economy to set up a program for veterans detached from civilian personnel. We have suggested in our tentative report to be out on the 26th that the Veterans Administration consider aiding us in the provision of adequate hospital and medical service in civilian population rather than only for veterans. I am inclined to think there is something in this.

We are entering on a period when the public and the veterans are going to demand from us all hospitals, doctors, dental and nursing facilities and services. In the next few weeks we are actually going to put something down on paper. The staff is to have a study of every plan they know of in the next few days. The Blue Cross plans have done splendid work in the field and are getting down to a complete coverage program. Parran and I had lunch together; he pointed out that he was not quite sure if we should approach the people telling them more or less what we have done, such as in tuberculosis, venereal disease program, hospital program, nursing program, in the hope that we might have covered a part of it and should shoot at something comprehensive in character. I wanted to acquaint you with a little of what we are doing and the point of view from which we are approaching it. We have a committee made up of all types and Democrats and Republicans, Liberals and Conservatives. We work through all agencies to accomplish something we shall all be proud of as a contribution to public health.

General Discussion

The program for the morning session of the conference was composed of talks and discussions led by representatives of the various departments and bureaus of the American Medical Association. The speakers were Mr. J. W. Holloway Jr., director of the Bureau of Legal Medicine and Legislation, Dr. J. S. Lawrence, director of the Washington Office of the Council, and Lieut. Col. Harold C. Lueth, liaison officer. Dr. Victor Johnson, Secretary of the Council on Medical Education and Hospitals, talked on the problems confronting the medical profession as found by the Council. Dr. Johnson said "The war has interjected a great many difficulties into our entire system of medical education, commencing with the college and premedical course and going through the many stages including the advanced residents' training. There are serious problems introduced at every point. . . . It is gratifying that hospitals are planning very carefully through committees which are working at the problem of providing additional training for the physicians returning from the war. Considerable expansion of residencies and fellowships is under way in approved hospitals. Large key hospitals are integrating their programs with other institutions. Interhospital cooperation has been very gratifying to us."

Medical Legislation

DISTRICT OF COLUMBIA

Bill Introduced.—H. R. 2424, introduced by Representative McMillan of South Carolina, proposes to establish in the Health Department of the government of the District of Columbia the position of Assistant Health Officer in Charge of Tuberculosis and to impose on him the duty to formulate and coordinate general policies relating to tuberculosis control, to appoint and fix the compensation of a supervisor of tuberculosis clinics, to allocate, with respect to race and sex, all tuberculosis beds maintained by the District of Columbia, to act as liaison officer between the Health Officer and various units dealing with tuberculosis control, and to review all estimates of appropriations for activities coming under his jurisdiction prior to the submission of such estimates to the Bureau of the Budget.

MEDICAL BILLS IN CONGRESS

Change in Status.—The House Committee on Ways and Means has ordered favorably reported H. R. 2348, to bring within the purview of the federal narcotic laws "any drug (as defined in the Federal Food, Drug and Cosmetic Act) found by the Secretary of the Treasury, after due notice and opportunity for public hearing, to have an addiction-forming or addiction-sustaining liability similar to morphine or cocaine, and declared by the Secretary to have been so found."

Bills Introduced.—S. 619, introduced by Senator George, Georgia, for himself and Senator Thomas, Utah, Senator Hill, Alabama, Senator LaFollette, Wisconsin, Senator Aiken, Vermont, and Senator Ellender, Louisiana, provides for vocational education and retraining, including part-time training and work-experience programs for the occupational adjustment and readjustment of youth and adults, including persons demobilized from essential war work or from the armed services. S. 652, introduced by Senator Maybank, South Carolina, and H. R. 2447, introduced by Representative Richards, South Carolina, provide for the issuance of death certificates in case of persons dying in the military or naval forces. S. 637, introduced by Senator Ellender, Louisiana, proposes to authorize the release of persons from active military service, and the deferment of persons from military service, in order to aid in making possible the education and training of physicians and dentists to meet essential needs. H. R. 2346, introduced by Representative Peterson, Florida, provides aid in the readjustment in civilian life of those persons who rendered war service in the United States merchant marine during World War II and to provide aid for the families of deceased war-service merchant seamen. This bill proposes to confer on war-service merchant seamen the benefits contemplated by the G. I. Bill of Rights and in addition, among other things, provides that any such seamen shall be entitled to medical, surgical and dental treatment and hospitalization without charge at hospitals and other stations of the Public Health Service if he is (1) in need of care and treatment for a disability with respect to which the disability endorsement on his certificate of maritime war service was made or (2) unable to defray the expenses of necessary care and treatment. The bill, too, authorizes the furnishing of medical advice and outpatient treatment by the United States Public Health Service to dependent members of the family of a disabled or deceased war-service seaman at such per diem cost as may be prescribed from time to time by the President for the hospitalization of dependents of Naval and Marine Corps personnel at any naval hospital. H. R. 2403, introduced by Representative Curtis, Nebraska, proposes to impose an occupational excise tax on certain dealers in peyote, to impose a transfer tax on certain dealings in peyote and to safeguard the revenue therefrom by registry and recording. The term "peyote" is defined to mean "all parts, including the seeds, of the plant Lophophora williamsii (Lem.) Coulter, and the plant Lophophora lewinnii Thompson, whether growing or not; any alkaloid extracted from any such part; and any compound, manufacture, salt, derivative, mixture or preparation of any such part or alkaloid." H. R. 2417, introduced by Representative Gathings, Arkansas, proposes to authorize the completion by the use of Lanham Act funds of hospital projects initiated by the Works Progress Administration and the Work Projects Administration. H. R. 2422, introduced by Representative Lynch, New York, proposes to provide for a system of old age and survivors' insurance for employees of religious, charitable, educational and certain other organizations. H. R. 2449, introduced by Representative Peterson, Florida, provides that any person who served in the United States merchant marine between April 6, 1917 and July 2, 1921 and who received a certificate of honorable discharge from the Sea Training Bureau of the United States Shipping Board shall be entitled to medical, surgical and dental treatment without charge at hospitals and other stations of the Public Health Service and may receive such care and treatment at the expense of the Public Health Service from public or private medical or hospital facilities other than those of the service when authorized by the officer in charge of the hospital or station of the Public Health Service at which application for care and treatment is made.

STATE LEGISLATION

Arizona

Bill Introduced.—H. 167, to amend the naturopathic practice act, proposes to extend the scope of a license to practice naturopathy by permitting the holder thereof to use biochemistry, pharmacotherapy, minor surgery and phytotherapy.

Arkansas

Bill Introduced.—S. 271 proposes to create a state cancer commission to be composed of the governor, the chairman of the Committee on Cancer Control of the Arkansas Medical Society and three other persons to be appointed by the governor, two of whom shall be members of the Arkansas Medical Society and the third member not to be a physician. The commission is to conduct such cancer clinics in such places as it deems proper and engage in a program of cancer education.

Connecticut

Bill Introduced.—H. 317 proposes that the law prohibiting the prescribing and use of contraceptives shall not be construed to prevent a licensed physician from prescribing a contraceptive when in the opinion of the physician pregnancy would endanger the life or health of the woman.

Illinois

Bill Introduced.—H. 163, to amend the narcotic drug act, proposes so to define narcotic drugs as to include isonipecaine.

Indiana

Bill Introduced.—H. 129 proposes to make any physician eligible to be selected and to serve as a member of the governing board of any hospital supported in whole or in part by public funds on the same terms and conditions as pertain to any other person to be selected for such service.

Iowa

Bill Introduced.—H. 319 proposes to require a hospital in which a child is born to take immediately after birth prints of each foot and to furnish copies thereof to the department of public safety. If a child is born elsewhere it is to be the duty of the attending physician, midwife or person in charge to notify the department of the birth and to execute such forms as may be required by the department. The department in such circumstances apparently is to cause prints of the feet to be taken.

Kansas

Bills Introduced.—S. 211 and H. 220 propose to authorize cities of the second class having a population of from 5,000 to 8,000 and located in a county having a population of from 11,000 to 14,000 to issue bonds up to $375,000 to build and equip a

hospital. S. 248 and H. 267 propose to prohibit the operation of a hospital, sanatorium, rest home, nursing home or a related institution unless licensed by the state board of health. H. 218 proposes to enact a separate naturopathic practice act and to create an independent board of naturopathic examiners. The bill proposes to define naturopathy as "the art, science and philosophy of natural healing as taught in recognized schools or colleges or schools of natural healing but shall not include the practice of medicine, surgery, osteopathy, chiropractic or Christian science."

Maine

Bill Introduced.—S. 216 proposes to require a physician attending a pregnant woman to take or cause to be taken a sample of her blood and to submit that sample for a standard serologic test for syphilis to an approved laboratory. The present law requires the physician to do this only if the woman consents.

Maryland

Bill Introduced.—S. 416 proposes to repeal the present statutory provisions relating to the practice of osteopathy and to enact in their stead an entirely new osteopathic practice act under the terms of which osteopaths would be authorized "to practice osteopathy in all its branches, which shall include the right to practice operative surgery with instruments and obstetrics, to administer anesthetics, antiseptics, narcotics and biologics, to sign birth, health and death certificates, and to perform such diagnostic and therapeutic procedures as are taught and practiced in the legally incorporated colleges of osteopathy of good repute." The present law specifically states that the license granted an osteopath authorizes him to practice by manipulation only.

Massachusetts

Bill Introduced.—S. 491 proposes to require the state to furnish medical care to recipients of old age assistance. Such recipient is entitled to the services of a physician of his own choice.

Michigan

Bill Introduced.—H. 182 proposes to prohibit the operation of a hospital, sanatorium, rest home, nursing home, infirmary or other similar institution without a license from the state department of health.

Minnesota

Bills Introduced.—S. 370 and H. 458 propose so to amend the narcotic drug act as to define the term "narcotic drugs" to include isonipecaine. S. 669 proposes to authorize the organization and operation of nonprofit medical care corporations to provide nonprofit medical care plans under which medical care is provided at the expense of the corporation to subscribers to the plan.

Nevada

Bills Introduced.—A. 62 proposes to prohibit the operation of a maternity hospital or maternity home unless licensed by the state board of health. A. 117, to amend the chiropractic practice act, proposes to define chiropractic "to mean the practice of chiropractic as taught in Chiropractic schools or colleges; and also the use of all necessary electrical, mechanical and hygienic and sanitary measures incident to the care of the body, including the science of palpating and adjusting the articulations of the human spinal column by hand."

New York

Bills Introduced.—S. 1028 proposes to prohibit scientific experiments or investigations on a living dog. S. 1130 proposes to make it the duty of the appropriate medical inspector to examine each public school pupil for symptoms of tuberculosis at least once a year.

New Mexico

Bills Introduced.—H. 195, to amend the medical practice act, proposes to require all licentiates of the board of medical examiners to register annually in November with the board and at that time to pay an annual registration fee of $2. H. 251 proposes to prohibit the employment in a public or private school of any person who has any communicable disease in a transmissible form. All applicants for any such position must submit a certificate from a licensed doctor of medicine that the applicant is free from any such disease. Such a certificate is to be required annually thereafter of employees.

North Carolina

Bill Introduced.—S. 178 proposes to authorize the establishment and operation of the North Carolina Hospital for Treatment of Spastic Children.

Ohio

Bill Introduced.—S. 90 proposes to require every physician attending a woman for conditions relating to pregnancy to take or cause to be taken a sample of her blood at the time of the first examination or within ten days thereafter and to submit that sample to an approved laboratory for a standard serologic test for syphilis.

Oregon

Bills Introduced.—S. 203 proposes so to amend the narcotic drug act as to define "narcotic drugs" to include isonipecaine. H. 367 proposes to require the state board of health to survey the location, size and character of existing hospitals and health centers and to evaluate the sufficiency of those existing facilities to supply the necessary physical facilities for furnishing adequate service. H. 372 proposes to make it unlawful to manufacture, sell or possess for the purpose of sale any live organism vaccine or any viable animal disease control vaccine without possessing an appropriate license from the department of agriculture.

Pennsylvania

Bills Introduced.—S. 307 proposes to prohibit the performance of an operation in a hospital or other place in which operations are performed without first requiring a preoperative study and diagnosis to be had and a record thereof to be made. The provisions of the bill, however, are not to apply to an emergency operation or oral surgery. The preoperative study referred to in the bill is to include a complete history of the case and the report of a thorough physical examination including examinations of the heart, blood vessels, blood, lungs and urine. H. 416 proposes to require that on or before the third anniversary of the termination of present hostilities every hospital be equipped with electric light fire warning systems. H. 474 proposes to authorize any state agency examining and licensing applicants for licenses to practice a profession or vocation to grant such a license without examination to a discharged member of the military or naval forces of the United States. H. 638 proposes to authorize the sexual sterilization of certain socially inadequate inmates of state institutions.

Tennessee

Bills Introduced.—S. 525 and H. 712 propose to authorize the establishment of a nonprofit hospital corporation to operate nonprofit hospital service plans.

Texas

Bill Introduced.—H. 438 proposes to prohibit the retail sale or other distribution of barbital except on the written prescription of a licensed physician, dentist or veterinarian.

Utah

Bills Introduced.—S. 202 proposes to authorize cities and towns to operate hospitals and to join with other cities, towns and counties in the construction and operation of such hospitals. S. 234 proposes to designate the state department of health as the state agency to receive funds which may be made available from federal agencies for the prevention and control of communicable diseases and for surveying, planning, constructing and operating hospitals, public health centers and related facilities. H. 213 proposes that any person ill with tuberculosis who neglects to obey the instructions of the state or local health board or officer in matters relating to the protection of others against the disease shall be placed under quarantine. H. 234 proposes to require of a food handler an annual medical examination for tuberculosis, venereal disease or any communicable or enteric disease.

Vermont

Bills Introduced.—H. 90 proposes to authorize the state board of health to cause a person suspected of being infected with a venereal disease to be examined to ascertain the presence of that disease and if found infected to require the person to submit to treatment. H. 186, to amend the laws relating to the practice of osteopathy, proposes, among other things, to authorize a licensed osteopath to practice surgery and obstetrics.

Washington

Bills Introduced.—S. 233 proposes to require the state department of health to survey the location, size and character of existing hospitals and health centers and to evaluate the sufficiency of those existing facilities to supply the necessary physical facilities for furnishing adequate service. S. 247 proposes that no written contract hereafter entered into by an employer on behalf of his employees for medical, surgical and hospital care shall be valid unless the contract provides for a yearly periodic renewal or rejection of the contract by a majority of the employees. S. 268 proposes to authorize the formation and operation of nonprofit hospital service corporations to operate hospital service plans. H. 386 proposes that every person entitled under law to medical care or services shall have the right to choose the person to perform the same for him on the same basis as that available to senior citizens.

West Virginia

Bills Introduced.—S. 107 and H. 188 propose to extend until Feb. 28, 1947 the present law which permits a nonstock hospital service corporation to operate medical service and hospital service plans. H. 321 proposes to designate the state department of health as the state agency to receive funds which may be made available from federal agencies for surveying, planning, constructing and operating hospitals, public health centers and related facilities.

Washington Letter

(From a Special Correspondent)

March 5, 1945.

Hearings on Hospital Construction Bill

Endorsement of Senate Bill S. 191, the "Hospital Construction Act," providing federal grants in aid to states for hospitals and related medical facilities, was expressed by leading medical authorities at hearings before the full Education and Labor Committee, under the chairmanship of Senator Murray of Montana, with Senator Pepper of Florida and Senator Hill of Alabama presiding in his absence. Dr. Victor Johnson of Chicago, Secretary of the Council on Medical Education and Hospitals of the American Medical Association, appeared, as did Dr. R. L. Sensenich of South Bend, Ind., member of the Board of Trustees. Invited to resumed hearings on March 12, 13 and 14 are William Green, A. F. of L.; Phillip Murray, C. I O.; Dr. Clarence Poe, chairman of the North Carolina governor's commission on hospitals; Basil MacLean, chairman of the New York commission on medical care; League of Women Voters; Dr. A. C. Bachmeyer of Chicago, director of studies of the Commission on Hospital Care; Dr. Frederick Hill of Waterville, Maine; Railway Labor Executives Association; American Farm Bureau Federation; National Farmers Union; American Institute of Architects; National Congress of Parents and Teachers; General Federation of Womens Clubs; Dr. Carl Reynolds, North Carolina health officer, and Governor Cherry of North Carolina.

Nationwide Program of Dental Care for Children Urged

A nationwide program of dental care for children, regardless of family income, was recommended by delegates at a dental conference called by the Children's Bureau here. A suggested program, according to Dr. Martha M. Eliot, associate chief of the bureau, called for appropriation of federal funds to make grants to state health departments for the development of such dental care. Conferees recommended that funds be provided for training personnel and for research in dental health of children. It was proposed that these services be developed as an extension of present maternal and child health programs now administered under joint federal-state auspices through the Social Security Act. Under the plan, dental services would be given to children in schools, hospitals, health centers, clinics and private offices. Trailer clinics would be used in remote places, as personnel and facilities were increased, to take in older children. Adequate remuneration for those specializing in children's dentistry was stressed.

Mexico City Conferences Discusses Health Problems

Good health throughout the hemisphere was discussed at the Mexico City conference in connection with the draft of an economic charter for the Americas, which was considered for later presentation to the United Nations conference in San Francisco. It was disclosed here that, if the charter is adopted, all the American nations acting together will "encourage, through expanding domestic and foreign trade and investment, the attainment everywhere of high levels of real income, employment and consumption, free from excessive fluctuations in order that their people may be adequately fed, housed and clothed and have access to the service necessary for health, education and well being." The charter was submitted to the Chapultepec conference by United States Assistant Secretary of State Will Clayton.

Lewis Demands Coal Royalty for Medical Service

In presenting his demand to bituminous coal operators for a 10 cent royalty on every ton of soft coal mined, John L. Lewis, president of the United Mine Workers, said that the money, estimated to yield $62,000,000 annually, would provide for his 400,000 union members "medical service, hospitalization, insurance, rehabilitation and economic protection." Although some operators strongly oppose the proposals, Charles O'Neill, head of one of the big coal producers' associations, admitted that the Lewis plan had "actuarial merit" and said that there was need for health insurance in other industries such as steel, as well as in coal mining.

Approval of Nurse Draft Bill Expected in House

Passage of some form of bill to draft nurses appeared to be a certainty this week. Republican Leader Martin said that Republicans would not oppose the measure, but he expected heated debate and amendments to delay the vote. Democratic Leader McCormack forecast victory for the legislation. Meanwhile the American Red Cross has announced that President Roosevelt's appeal for nurses produced 13,700 volunteer applications, 9,641 being certified for service.

Official Notes

DOCTORS LOOK AHEAD

Much attention is being attracted by the broadcasts in the Doctors Look Ahead series, especially that of February 10 dealing with new methods in the treatment of heart disease. Unsolicited mail for all this year's broadcasts is larger than ever before in the history of the American Medical Association broadcasts. Audience mail is not being requested because of paper and personnel conditions.

Doctors Look Ahead is heard on one hundred and twenty-three stations of the National Broadcasting Company network each Saturday at 4 p. m. Eastern War Time (3 p. m. Central War Time, 2 p. m. Mountain War Time and 1 p. m. Pacific War Time). Some stations may record the program and broadcast it at a time which suits their schedule better. Local newspaper radio announcements should be consulted.

The next three programs deal with the following topics:

March 10. Rheumatic Fever (Dr. Edwin P. Jordan).
March 17. Women at War (in cooperation with the Office of War Information).
March 24. Juvenile Delinquency.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

State Meeting Canceled.—The annual meeting of the Arkansas Medical Society, which was scheduled to be held in Little Rock April 23-24, has been canceled.

CALIFORNIA

Popular Medical Lectures.—Dr. Karl M. Bowman, San Francisco, gave the first lecture in the sixty-third course of popular medical lectures sponsored by Stanford University School of Medicine, March 2, on "Mental Disturbances in Relation to the War.". Other lecturers include:

Brig. Gen. Charles C. Hillman, M. C., Medical Services to the Armed Forces, March 16.
Dr. Lowell A. Rantz, San Francisco, Penicillin, March 30.
Dr. Thomas Henshaw Kelly, San Francisco, The Rh Factor in Marriage and Childbearing, April 13.

CONNECTICUT

Public Believes Physicians Should Advise on Birth Control.—In Connecticut, one of two remaining states still "outlawing" birth control, 85 per cent of the adult population believed that licensed physicians should be permitted to advise married women to use birth control measures when their health would be jeopardized by immediate childbirth, it was revealed in a statewide poll recently conducted by Elmo Roper, according to the Planned Parenthood Federation of America. A bill, now before the Connecticut legislature, would permit Connecticut physicians to prescribe birth control measures for married women for health reasons. The Roper survey disclosed that of Connecticut residents over 21 years old 70 per cent believe that the state laws should allow physicians to give birth control advice to married people who want to use it. A total of 78 per cent favor giving physicians discretion to prescribe birth control measures to married persons "who are already so poor that adding another member to the family would probably mean that the rest wouldn't have enough to eat." More than four fifths, or 85 per cent, feel that doctors should have the same freedom of medical judgment "where the mother would probably become an invalid if she was to have a baby," 87 per cent in cases in which the doctor thought the mother might die if she was to have another baby. If there is danger that the child would be badly deformed or feebleminded for life, opinion is 87 per cent in favor of doctors prescribing birth control. The survey, conducted among all economic and population groups, was carried on last December. Of those interviewed 45 per cent were Protestant, 39 per cent Roman Catholic and 9 per cent Jewish. Among Roman Catholics, 75 per cent favored permitting physicians to give birth control information to married persons if another child at the time might cause the mother to become an invalid. If the mother's life was endangered, 78 per cent of Roman Catholic citizens interviewed favored permitting birth control measures. Besides Connecticut, Massachusetts is the only other state which refuses physicians the right to prescribe birth control under any conditions.

FLORIDA

State Meeting Canceled.—The Florida Medical Association announces the cancellation of its meeting which was scheduled to be held in Jacksonville, April 12-13.

Personal.—Dr. Terry Bird, Tallahassee, resigned on January 1 as director of the Florida Crippled Children's Commission to join the staff of the medical department of the Pan American Airways.——Dr. John W. McClane has been named director of the Nassau County Health Department, succeeding Dr. George A. Dame, who resigned to become associated with the state board of health (THE JOURNAL, Nov. 4, 1944, p. 647).

ILLINOIS

The State's Health.—There were 86,803 deaths from all causes last year in Illinois, a substantial decline over the 90,705 figure of 1942, according to a report by Dr. Roland R. Cross, state director of public health. Births fell to 138,330 from 152,608 in 1943, a reduction of 14,278, or about 9 per cent. The excess of births over deaths was 51,527 in 1944 and 61,903 in 1943. The infant death rate, 32.4 per thousand, was an all time low for the state, comparing with 33.2 per thousand in 1943. The maternal rate, 1.7 per thousand births, was also the lowest ever recorded in Illinois, comparing with 1.9 in 1943. Particularly noteworthy, according to the report, was the remarkably low number of deaths from diphtheria, 23 against 77 in 1943; from infantile diarrhea, 188 against 263 in 1943, and from pneumonia, 2,642 against 3,179 in 1943. Heart disease continued to be the leading cause of death, accounting for 30,522 fatalities, against 31,328 in 1943. Cancer was responsible for 12,394 deaths, against 12,105 in 1943, the second highest cause of mortality.

Chicago

Capps Prize Awarded.—Dr. James L. d'A. Roth, who graduated at Northwestern University Medical School in 1944, is the recipient of the Joseph A. Capps Prize for medical research of $400, awarded by the Institute of Medicine of Chicago. Dr. Roth was chosen for his investigation on "The Effect of Caffeine on the Stomach."

Personal.—Clay G. Huff, Sc.D., professor of parasitology at the University of Chicago, has accepted an invitation from the Institute of Public Health and Tropical Diseases of Mexico City to visit that institution as guest investigator from March 1 to April 15. Dr. Huff's trip will be under the auspices of the U. S. Department of State.——Reuben G. Gustavson, Ph.D., Boulder, Colo., who resigned as president of the University of Colorado, has been appointed dean of the faculties of the University of Chicago, effective July 1.

Medical Schools and Hospitals Cleared of Charges of Mistreating Dogs.—Chicago medical schools and hospitals were cleared February 6 of charges of mistreating dogs in a report submitted to a board of health advisory committee by board of health investigators, according to the Chicago *Sun*. The charges, made by Mrs. Charles M. Petkus, vice president of the Illinois Animal Welfare League, specifically accused the medical schools of Chicago, Northwestern, Loyola and Illinois and Michael Reese Hospital of maintaining dirty kennels for dogs used for experimental purposes.

INDIANA

State Society Publishes Physical Fitness Number.—The *Journal of the Indiana State Medical Association* has dedicated its March issue to the physical fitness program. In addition to editorials on the subject, seven original articles discuss various aspects of the national program:

A Medical Viewpoint on National Fitness, Dr. John W. Wilce, director, University Health Service, Ohio State University, Columbus, Ohio.
Fitness for Duty of Military Patients on Discharge from Hospital, Major Gen. George F. Lull, Deputy General, United States Army, Surgeon General's Office, Washington, D. C.
General Considerations of the Physical Fitness Problem, Dr. Wendell D. Little, Indianapolis, member, Committee on Physical Fitness, Indiana State Medical Association.
What Is Physical Fitness? Dr. Roscoe L. Sensenich, South Bend, member of Joint Committee on Physical Fitness of the American Medical Association and the National Committee on Physical Fitness.
Physical Fitness, Dr. James E. McMeel, Medical Director of the University of Notre Dame, Notre Dame, Ind.
Physical Fitness from a Psychiatric Standpoint, Dr. E. Vernon Hahn, Indianapolis.
Some Practical Considerations of Cardiovascular Examinations in Youth, Dr. Arthur B. Richter, Indianapolis.

The issue also contains the following ten special articles:

Recovery and Cure for America's Physically Unfit, Dr. Morris Fishbein, Editor, THE JOURNAL, Chicago.
The Wealth of the Nation Is the Strength of Its People, John B. Kelly, chairman, National Committee and Council on Physical Fitness, Washington, D. C.
A Moses Is Needed, Dr. Heilman C. Wadsworth, Washington, member, Committee on Physical Fitness, Indiana State Medical Association.
Health and Fitness in the Schools, Frank S. Stafford, principal specialist in physical fitness, Federal Security Agency, United States Office of Education, Washington, D. C.
A Message on Physical Fitness, Capt. C. Raymond Wells (DC), U.S.N.R., member, Joint Committee on Physical Fitness of the American Medical Association and the National Committee on Physical Fitness, Washington, D. C.
Physical Fitness Through Sports, Elmer F. Layden, commissioner, National Football League, Chicago.
Fitness Through Competitive Game Training, Bo McMillin, head football coach, Indiana University, Bloomington.
Physical Fitness, Ed. McKeever, football coach and athletic director, University of Notre Dame, Notre Dame.
Physical Fitness for American Youth, W. Blaine Patton, sports editor, the Indianapolis *Star*, Indianapolis.
Competitive Athletics Our Greatest Asset, William F. Fox Jr., sports editor, the Indianapolis *News*, Indianapolis.

MICHIGAN

Maud Watson Dies.—Maud E. Watson, Ph.D., director, child guidance division, Children's Fund of Michigan, Detroit, died January 31 at the University Hospital, Ann Arbor, aged 58.

Memorial Volume for William Donald.—The Beaumont Committee in conjunction with the Wayne University College of Medicine, Detroit, is preparing a memorial volume commemorating the life and services of the late Dr. William M.

Donald, past president of the Wayne County Medical Society and one of the founders of the lectureship foundation committee, at the society headquarters, 4421 Woodward Avenue, Detroit 1.

James Bechtel Resigns.—Mr. James Bechtel, who has been executive secretary of the Wayne County Medical Society since 1935, has resigned, effective February 1. Miss Else Kolhede, formerly in charge of offices of the county society, has been named to succeed him. Mr. Bechtel will be associated with Mr. Jerry Totzka, formerly Michigan director of drugs and drug stores, in the Drug Industries Company of Detroit. The principal product at the present time of the Drug Industries Company is a line of prescription vitamins available to the public only on the prescription of a physician, it is reported.

Lectures on Chemotherapy.—The department of chemistry in the college of liberal arts, Wayne University, Detroit, opened a series of lectures on chemotherapy February 13 with a discussion by Herbert E. Carter, Ph.D., Urbana, Ill., on "Some Biochemical Aspects of Antibiotic Substances." Frederick F. Blicke, Ph.D., Ann Arbor, discussed "Synthetic Antispasmodics" February 20. Others in the series included:

William H. Feldman, D.V.M., Rochester, Minn., Chemotherapy in Experimental Tuberculosis, February 27.
Clarence K. Banks, Ph.D., Detroit, Organometallic Compounds, March 6.
Harry S. Mosher, Ph.D., State College, Pa., Synthetic Antimalarial Drugs, March 13.
Elmore H. Northey, Ph.D., Bound Brook, N. J., Sulfonamide Chemotherapy: Facts and Fancies, March 20.
Willard H. Wright, Ph.D., Bethesda, Md., Past Developments and Present Needs in the Chemotherapy of Parasitic Diseases, March 27.

MINNESOTA

State Inaugurates Accreditation of Schools in Tuberculosis Program.—A program has been launched in Minnesota whereby individual schools or entire school systems are to be certified under a plan developed by the American School Health Association. The subcommittee for Minnesota, consisting of Dr. Edward A. Meyerding, St. Paul, executive secretary, Minnesota Public Health Association, Dr. Sidney A. Slater, medical director of the Southwestern Minnesota Sanatorium, Worthington, and Dr. Lewis S. Jordan, medical director of Riverside Sanatorium, Granite Falls, has drawn several classifications to provide for schools doing different degrees of tuberculosis work, the class A certificate, the highest classification, going to the ideal program, which would detect all tuberculosis in any stage of its development and would provide for the creation of an environment entirely free from the disease. Under the program a tuberculosis control award will be given by the American School Health Association certifying that the recipient has fulfilled the minimum requirements set up by the association for the control of tuberculosis. Because the standards for certification would necessarily differ in the various states, depending on such factors as the incidence of infection, it was considered best to have the subcommittee of the school health association in each state decide on the standards for its own state. Dr. Jay A. Myers, Minneapolis, is credited with being the originator of the plan.

MISSISSIPPI

Public Health Election.—Dr. Archie L. Gray, Jackson, was recently chosen president-elect of the Mississippi Public Health Association at its meeting in Jackson. Dr. Cyrus M. Shipp, Bay St. Louis, was installed as president. Dr. Hugh B. Cottrell, Jackson, is the secretary-treasurer of the association.

Guy Post Named to New Position.—Dr. Guy R. Post, Clarksdale, director of the Coahoma County Health Department for six years, has accepted a position as medical director of the crippled children's service and medical consultant of vocational rehabilitation for the state of Mississippi. Newspapers reported that he was to take up his new work on February 16, with offices in the Standard Life building, Jackson.

NEW YORK

Demonstration Area Chosen for Rheumatic Fever.—In a recent talk Dr. John Fred Hiss, professor of clinical medicine, Syracuse University College of Medicine, announced the organization of a demonstration area for the treatment of rheumatic fever for New York State to be set up in the four counties of Onondaga, Cayuga, Cortland and Oswego. The purpose of the program, which will be extended to the rest of the state when successfully organized in these four counties, is to provide a complete plan for combating rheumatic fever. The proposed plan will be known as the Syracuse District Cardiac Program. In explaining the need for such a program Dr. David D. Rutstein, Albany, deputy commissioner of health of New York City, enumerated as reasons the difficulty of diagnosis, the chronic nature of the disease, the wide prevalence of the disease and the complexity of care necessary for patients. In discussing the problem Dr. Homer F. Swift of the Rockefeller Institute for Medical Research said that in New York City in 1938 five times as many deaths were caused among children by rheumatic fever as by whooping cough, spinal meningitis, measles, diphtheria and scarlet fever combined. Other speakers on the program at which the new project was announced included Drs. Albert D. Kaiser, Rochester, and T. Duckett Jones, Boston.

Seek Fund to Finance Distribution of Blood.—On February 16 the legislature was asked to appropriate $100,000 for use by the state commissioner of health in establishing a program for the collection and distribution of human blood and its derivatives for the treatment of the sick and injured in the state, the New York *Times* reported. The idea stemmed from a suggestion made to the health department two years ago by the state medical society and was presented in a bill by Assemblyman Lee B. Mailler, chairman of the New York State Health Preparedness Commission. The state department after a two year study formed the following conclusions:

That the current use of blood and blood derivatives in hospitals and medical practice in the state to date is only 60 per cent of that estimated to be the desired use on the basis of current knowledge of the value of these products.

That more than 90 per cent of the hospitals in the state are not in a position to carry out adequate testing for blood types with regard to the Rh factor, largely because of the scarcity and cost of the so-called potent Rh typing serum.

That for the money now being spent in this field the state could supply to communities all the blood and plasma needed as well as a large variety of useful derivatives and special products, such as Rh typing serum and antipertussis or anti-whooping cough serum which are not now available.

It was stated that the present use of blood and its derivatives was confined to the larger urban centers. If approved, it is anticipated that the program during its first year would not be complete but would make blood products widely available and would supply important additional derivatives.

New York City

The Harvey Lecture.—Dr. Edwin B. Astwood, assistant professor of pharmacotherapy, Harvard Medical School, Boston, will deliver the sixth Harvey Society Lecture of the current series at the New York Academy of Medicine, March 15. His subject will be "Chemotherapy of Hyperthroidism."

Orthopedic Rehabilitation.—Dr. Vasili D. Chakhlin, director of the Moscow Orthopedic and Prosthetic Institute, and Dr. Philip D. Wilson addressed the New York County chapter of the American-Soviet Medical Society, February 28 on "Reconstruction by Orthopedic Treatment." The film "Soviet Medicine at the Front" was also shown at the meeting.

Free Chest X-Rays for Students.—Beginning February 26 all pupils in the third and seventh terms of the New York City Vocational High Schools will be offered free tests and, when necessary, free chest x-rays to determine that their lungs are in good condition. Both tests and x-rays will be given in the school buildings under the joint supervision of the city department of health and the board of education. Pupils must obtain the written consent of a parent or guardian in order to qualify for this service.

New Child Center.—The building equipment at 2 East 105th Street, formerly used by the New York Society for the Prevention of Cruelty to Children, is being donated by the society to a group representing Catholic, Protestant and Jewish welfare organizations for use as a home for neglected and dependent children between the ages of 2 and 16. The new group, the Association for Temporary Care of Children, held its organization meeting in Mayor La Guardia's office recently, choosing Mrs. Helen E. Dickinson, who recently returned from India, where she served as a representative of the American Red Cross as director of the new home. The society will maintain part of the maintenance of the new project.

Columbia Merges Medical and Dental Staffs.—The dental and medical faculties of Columbia University have been merged by action of the board of trustees, according to the New York *Herald Tribune*, February 7. The dentistry staff will have "departmental autonomy" and some members will have seats on the faculty of medicine, but the curriculum will be in charge of a "committee on dental education, a majority of whose members will be chosen by the dental staff," Nicholas Murray Butler, Ph.D., president, said. The name of the School of Dental and Oral Surgery will be continued. An associate dean for dental and oral surgery will be executive officer of the university department of dental and oral

surgery. Up to now the school has been headed by Houghton Holliday, D.D.S., as associate dean. Medical and surgical staffs of the Medical Center recognize need for better dental services for ward and clinic patients, and closer coordination will be achieved with unified action and direction, it was stated. Anatomy, bacteriology and nutrition "are as much dental as they are medical subjects." The decision aims to insure active support of dental teaching and research by its "strong staff of physicians, surgeons, scientists, nurses and public health leaders" and "to emphasize the importance of dentistry itself." The report indicated that there had been considerable objection to the consolidation by members of the dental faculty.

OHIO

Dr. George J. Heuer Gives Morris Lecture.—Dr. George J. Heuer, professor of surgery, Cornell University Medical College, New York, gave the eighth Roger S. Morris Memorial Lecture at the University of Cincinnati College of Medicine, February 20 (THE JOURNAL, Sept. 16, 1944, p. 182). His subject was "The Surgical Treatment of Chronic Constrictive Pericarditis: A Postscript."

Research in Toxins and Antitoxins.—Western Reserve University School of Medicine, Cleveland, has been given $12,600 from Wyeth, Inc., Philadelphia, pharmaceutical and biological manufacturers, to conduct studies of toxins and antitoxins in order to determine more closely the active principles of these substances. The research work will be carried on by Louis Pillemer, Ph.D., research immunologist of the university's Institute of Pathology, under the direction of Enrique E. Ecker, Ph.D., professor of immunology. An attempt will be made to isolate the active substance or substances given off, for instance, by Clostridium tetani which causes lockjaw, and also the active substance in the antitoxic serum which affords protection in this disease. It is hoped to purify the toxin and the antitoxin of tetanus to a high degree—up to the point of homogeneity, if possible.

Joseph Wearn Named Dean of Western Reserve.—Dr. Joseph Treloar Wearn, professor of medicine at Western Reserve University School of Medicine, Cleveland, has been appointed dean of the medical school, succeeding Dr. Torald H. Sollmann, who retired as dean on July 1, 1944. Dr. Wearn will continue as professor of medicine at the university and as director of the department of medicine at Lakeside Hospital. In 1917 Dr. Wearn graduated at the Harvard Medical School, Boston, where he was serving as associate professor of medicine when he joined Western Reserve in 1929. Dr. Wearn is also a consultant to the Surgeon General of the United States Army, consultant to research and development branch of the Office of the Quartermaster General of the U. S. Army, chief of the division of physiology, committee of medical research and chairman of the subcommittee on blood substitutes of the Office of Scientific Research and Development.

PENNSYLVANIA

Personal.—Dr. Hilding A. Bengs, North Warren, who has been associated with the Warren State Hospital since 1932, was recently appointed assistant director of the bureau of mental health, state department of welfare. Dr. Bengs was secretary of Warren County Medical Society and had served in that capacity since 1937.——Dr. Budd J. Reaser, Martins Creek, was elected president of the Northampton County Board of Prison Inspectors recently.

Diplomates Association Formed.—The Diplomates' Association of Berks County Physicians was organized January 17 under the sponsorship of the Reading Eye, Ear, Nose and Throat Society. Membership is extended automatically to diplomates of boards listed in the Directory of Medical Specialists, and the group will meet once a year jointly with the Reading Eye, Ear, Nose and Throat Society. Officers of the new group include Drs. William S. Bertolet, president, Fred B. Nugent, president-elect, and Thomas Butterworth, secretary, all of Reading. At the recent meeting Dr. Harrison F. Flippin, Philadelphia, discussed "The Clinical Use of Penicillin."

Memorial to Physician.—The improvements and expanded services at Lehigh University, Bethlehem, will be made possible by a gift of Dr. William L. Estes, president of the Medical Society of the State of Pennsylvania, as a memorial to his father, the late Dr. William L. Estes, surgeon in chief at St. Luke's Hospital. The Estes grant will be used to revamp the present elementary biology laboratory, the new facilities to be rededicated as the William Lawrence Estes Laboratory. Dr. Estes, the donor, graduated at Lehigh University in 1905 and at Johns Hopkins University School of Medicine, Baltimore, in 1909, subsequently succeeding his father as surgeon in chief at St. Luke's Hospital. His father was lecturer in physiology and hygiene at Lehigh from 1883 to 1923, receiving the honorary degree of doctor of science there in 1934.

Philadelphia

Rockefeller Grants for Postwar Training.—The Rockefeller Foundation has given the University of Pennsylvania School of Medicine funds to provide postwar training at an advanced level for a number of young medical men of exceptional promise whose medical education has been interrupted by the war and who now are in the armed forces, it was announced February 22. The men will be selected for study and work, under distinguished teachers, in surgery, pharmacology or psychiatry, the foundation having made three grants of $8,000 to provide the training in each of those particular fields. The training, which will begin after the men have concluded their military service, will cover a maximum of four years, and the number of recipients will depend on the extent and character of the instruction required. Those in the field of surgery will study and work under Col. Isidor S. Ravdin, M. C., who is on leave of absence from the Harrison professorship of surgery and the directorship of the Harrison Laboratory of Surgical Research at the university while he serves as commander of an army hospital in India. The men receiving training in pharmacology will be under Dr. Carl F. Schmidt, professor of pharmacology in the University of Pennsylvania School of Medicine, and those in psychiatry under Dr. Earl D. Bond, professor of psychiatry in the school of medicine and the Graduate School of Medicine and vice dean for neuropsychiatry in the latter school.

RHODE ISLAND

Seminar on Industrial Health.—A graduate seminar in industrial health opened at Brown University, Providence, February 20, with a talk by Dr. Dwight O'Hara, acting dean and professor of preventive medicine, Tufts College Medical School, Boston, on "Bases of Industrial Medical Practice." The seminar is under the auspices of the new department of medical sciences (THE JOURNAL, July 22, 1944, p. 861). Mr. J. J. Bloomfield, senior sanitary engineer, U. S. Public Health Service, spoke February 27 on "Labor Management Relationships in Industrial Health Programs," and Dr. Harvey Bartle, Philadelphia, formerly chief medical examiner and medical director, Pennsylvania Railroad, March 6, on "Industrial Health: A Specialty." Others in the series include:

Dr. John J. Wittmer, personnel and medical director, Consolidated Edison Company, New York, Absenteeism in Industry, March 13.
Dr. Clarence O. Sappington, editor, Industrial Medicine, Chicago, What Medicine Has to Offer Industry, March 20.
Louis Schwartz, medical director, U. S. Public Health Service, Industrial Skin Diseases, March 27.
Dr. William A. Sawyer, medical director, Eastman Kodak Company, Rochester, N. Y., Profits in an Industrial Health Program, April 3.
Dr. Edward C. Holmblad, medical director, Railway Express Agency, Chicago, Preplacement and Periodic Physical Examinations, April 10.
Mrs. Irene Willoughby, R.N., industrial nursing consultant, Liberty Mutual Insurance Company, Industrial Nursing Consultation from the Insurance Viewpoint, April 17.
Mrs. William J. Connolly, director, state department of labor, State Department of Labor and the Workers' Health, April 24.
Miss Catherine R. Dempsey, R.N., director of nurses, Simplex Wire and Cable Company, Work of the Nurse in Industry, May 1.
Mr. Jesse C. Williams, R.N., director of nurses, Pratt and Whitney Aircraft Division, United Aircraft, In-Plant Training for the Industrial Nurse, May 8.

The series was arranged by the Rhode Island Society of Industrial Physicians and Surgeons and the Rhode Island Industrial Nurses' Club in conjunction with the industrial health committee of the Rhode Island Medical Society.

TEXAS

Meeting of Pathologists.—At the annual meeting of the Texas Society of Pathologists in Dallas, January 28, it was voted unanimously to affiliate with the Texas Academy of Science, which is a part of the American Association for the Advancement of Science. Officers of the society include Drs. Paul Brindley, Galveston, president; May Owen, Fort Worth, president-elect; Sidney W. Bohls, Austin, vice president; John J. Andujar, Fort Worth, secretary-treasurer, and Charles T. Ashworth, Dallas, secretary-treasurer-elect. The Texas Society of Pathologists has drawn up a model bill to be presented to the legislature establishing a modern medical examiner system. The present law in Texas permits justices of the peace to serve as coroners and medical examiners.

Educational Lectures.—Dr. J. Arnold Bargen, Rochester, Minn., lectured at the University of Texas Medical Branch, Galveston, under the auspices of Phi Chi medical fraternity. His subject was "Modern Concepts of Intestinal Infection." Dr. Walter C. Alvarez, Rochester, gave the annual Phi Beta Pi Lecture at the school March 2 on "Nervous Indigestion." Dr. James S. Plant, the director of the Essex County Juvenile

Clinic, Newark, N. J., presented the William Buchanan Lecture at the school, March 5, speaking on the principles of management of psychologic problems in children. Dr. Plant participated in a conference on psychologic and psychiatric problems in children, March 9, at the Hotel Stephen F. Austin, Austin. The conference was sponsored by the University of Texas Child Health Program, the Texas Section of the American Academy of Pediatrics, the Texas Pediatric Society, the Texas Society for Mental Hygiene, the Hogg Foundation of the University of Texas and the children's division of the state department of public welfare. Other speakers included Dr. Milton E. Kirkpatrick, director of the Guidance Center of New Orleans, and Dr. John H. Waterman, director of the Guidance Center of Houston.

Recommendations to Curb Tuberculosis in San Antonio.—*Public Health Reports*, February 2, discusses a recent survey of the U. S. Public Health Service in San Antonio, which has the highest tuberculosis death rate of any large city in the United States. Recommendations are presented to overcome the disease, which is the second leading cause of death in the city for persons of all ages. One out of every ten deaths is from this disease. Heart disease, including coronary disease, is the chief cause of death, forming 15.2 per cent of the total deaths. A chest x-ray survey of more than 20,350 residents, of whom almost 19,000 were Latin-American, revealed 993 persons, or 4.9 per cent, with reinfection tuberculosis. The survey took four months. Similar surveys in various sections of the country reveal that an average of approximately 1 per cent of the population has reinfection tuberculosis. More than 90 per cent of the persons examined were of Latin-American extraction; only a small number were colored. Very small differences in the proportion of reinfection of tuberculosis were observed between the Anglo-Americans and the Latin-Americans. Among the 1,277 Anglo-Americans, 71 cases of reinfection tuberculosis, comprising 5.5 per cent of the group, were found. Among 18,607 Latin-Americans, 914 cases were discovered, or 4.9 per cent. The rates were higher among the males than among the females both in the Latin-American and in the Anglo-American groups. The creation of an office of tuberculosis control in the city health department and the appointment of a full time physician as director are considered essentials in the development of a control program which would include a permanent plan of case finding, clinical care, sanatorium treatment and follow-up, with rehabilitation being implemented in cooperation with all interested agencies.

WEST VIRGINIA

State Meeting Canceled.—The seventy-eighth annual meeting of the West Virginia State Medical Association, which was scheduled for Clarksburg, May 14-15, has been canceled. This will be the first year that an annual session has not been held by the association since its organization in 1867.

Positions Available.—The Merit System Council of the State of West Virginia recently announced a number of miscellaneous positions available throughout the state. The positions include those of deputy state health commissioner, director of maternal and child hygiene, assistant director of maternal and child hygiene, director of communicable diseases, director of venereal disease control and director of public health education, as well as miscellaneous positions as local health officer, bacteriologist, nutritionist consultant and public health nursing supervisors. A position is also available as chief of medical services in the department of public assistance and one as cancer control education consultant. State residence requirements for these positions have been waived. Additional information may be obtained from the Merit System Council, 212 Atlas Building, Charleston 1.

Actions of State Medical Society.—At a meeting January 18 the council of the West Virginia State Medical Association rejected a proposal of the legislative committee that pathologists be licensed by the public health council to practice in the state. The proposal, previously unanimously approved by the legislative committee, would have required applicants to have an M.D. degree, to have resided in a community in West Virginia for at least two years, to be citizens of the United States, to have the endorsement of the local medical society and to pass such examination as might be required by the public health council.——A committee of five members has been named to work out details for providing psychiatric education for members of the state medical association as the result of the report on the returns of more than five hundred psychiatric questionnaires sent to members. Returns indicated that the majority favored some sort of psychiatric education through the medium of local society meetings and articles in the state journal.

GENERAL

Statistical Bulletin Completes Twenty-Five Years.—The Statistical Bulletin of the Metropolitan Life Insurance Company with its January issue announces its completion of twenty-five years. An editorial by Louis I. Dublin, Ph.D., New York, lauds the bulletin for its usefulness as a medium in public health education.

Examination in Internal Medicine.—The next written examination of the American Board of Internal Medicine will be held on October 15. The closing date for filing applications is August 1. Candidates in the armed forces may take the written examination at their station with the permission of their medical commanding officer. Dr. William A. Werrell, 1301 University Avenue, Madison 5, Wis., is the assistant secretary-treasurer of the board.

Tuberculosis Association Surveys Activities.—The National Tuberculosis Association has launched a five year survey of all educational activities of its organization to evaluate and improve the materials and methods in use at the present time as well as to formulate a constructive program for the future. According to the *Bulletin* of the National Tuberculosis Association, the study will extend over the period of 1945-1950 and will involve a thorough analysis of the organization's personnel needs and the selection of pilot centers on a local level in cooperation with state associations. A technical or steering committee, under the chairmanship of Werrett W. Charters, Ph.D., director of research, Stephens College, Columbia, Mo., will work with four associated committees on program, materials, personnel training and pilot study. The technical committee is composed of Dr. Charters, Dr. Herman E. Hilleboe, chief, tuberculosis control division, U. S. Public Health Service, and Dr. Kendall Emerson, managing director of the National Tuberculosis Association and the chairman of the other four committees. In addition to the working committees a national advisory committee will be appointed, made up of persons prominent in the fields of public health, welfare and education. Service heads at the national office will constitute a staff resource committee available for consultation whenever necessary.

Footprinting of Infants.—The procedure of taking footprints is explained in an article entitled "Footprinting of Infants," published in the January Law Enforcement Bulletin of the Federal Bureau of Investigation. Individuality, continuity and immutability are three features of any system for personal identification purposes, the bulletin states. Identification by fingerprints, palmprints or footprints is the only method of personal identification which satisfies all of these requirements. The friction areas of the fingers, palms and feet have papillary ridges which form well defined patterns and contain distinctive characteristics. The possibility of any two human beings having surface areas of skin on their fingers, palms or feet which have exactly the same ridge characteristics is so remote that it is beyond the realm of probability. In explanation of these three features it is stated that the definitive formation of the ridges on the palms, fingers and feet of human beings begins several months before birth and remains throughout the entire lifetime. These ridges are intact after death up until the time decomposition of the body takes place. During the entire lifetime of a human being the ridges of his hands and feet remain exactly in their original formations and cannot be changed. The majority of hospitals today are using the methods of footprints for identification of infants in preference to fingerprints or palmprints. The reason for this is that the ridges are more pronounced on the feet and it is easier to obtain prints of this surface from newborn babies. The purpose of taking footprints is to provide a permanent record of individuality so that, in the event of a question arising later as to the identity of the child and its mother, conclusive proof of its identity can be offered. The footprints of the infant, therefore, should be taken immediately after birth. The equipment required for taking footprints is inexpensive and easy to obtain and requires but little training to use. It consists of printer's ink (a black heavy paste), a roller and an inking plate (a small piece of plate glass). Ordinary writing ink, colored ink and stamp pad ink are not very satisfactory mediums because they are too light or too thin and take too long to dry. The roller best adapted to this work is similar to that used by printers in making galley proofs and should be about 3 inches long and 1 inch in diameter. In preparing to take a set of impressions a small daub of ink should be placed on the inking glass and thoroughly rolled until a thin, even film covers the entire surface of the glass. To insure best results, the area of the feet to be printed should be thoroughly dried by wiping with a piece of gauze. The ink may be applied directly to the infant's feet

from the roller, but care should be exercised to insure a very thin film of ink on the portion of the foot to be printed. The inked area is then pressed firmly on the surface of the card or certificate, but caution must be used to avoid either the foot or the paper being moved during the printing process in order to avoid smudging the print. Too much ink and too much pressure will result in a mere blot on the card, which of course is of no value for identification purposes.

Absentee Sickness Rate Soars to Reflect Wartime Conditions.—Absenteeism due to sickness among male industrial workers showed a substantial increase for the third quarter of 1944, sending the total industrial sickness rate in this year up to 37 per cent above the average for the period 1935-1944, according to statistics released by the Industrial Hygiene Division of the U. S. Public Health Service. Nonrespiratory-nondigestive diseases rose 15 per cent above a like period in the previous year. Conditions contributing to this record included a 26 per cent increase in rheumatism, a 29 per cent increase in neurasthenia and other diseases of nervous or mental origin and a 34 per cent increase in diseases of the genito-urinary system. The incidence of rheumatic diseases, diseases of the heart and arteries, nephritis and nervous diseases has never been equaled or exceeded within the past decade. Nervous diseases showed the highest rate of increase, rising 76 per cent above the ten year mean. The rate of respiratory diseases, while slightly lower than in 1943, was 32 per cent above the average for the decade. Digestive diseases also rose to a rate exceeding anything experienced within the ten year period. Employment conditions peculiar to wartime are held responsible. Categories of disease showing the highest increase involve mainly older workers. The hiring of workers long unemployed or retired is one factor held to contribute to the record sickness rate, as is the employment of youths and other inexperienced personnel and the necessity for employing in industry men rejected by the armed services. Wartime working and living conditions are thought to be reflected, since other factors held accountable include emotional strain and personal mental conflict, overcrowding in plants and war communities, fatigue due to the lengthened work week, and night work.

FOREIGN

Jeffries Award Goes to Sir Harold Whittingham.—The John Jeffries award for outstanding contributions to aviation medicine was awarded January 31 to Air Marshal Sir Harold E. Whittingham, director of Royal Air Force medical services (THE JOURNAL, Sept. 30, 1944, p. 313). The presentation was made by Major General David N. W. Grant, Air Surgeon of the U. S. Army Air Forces, during a meeting of the Institute of Aeronautical Sciences in New York.

Committee Named for Trypanosomiasis.—The British Secretary of State for the Colonies has appointed a tsetse fly and trypanosomiasis committee to consider and advise on the coordination of action, including research, directed against human and animal trypanosomiasis and, in particular, against the tsetse fly as the chief vector, according to *Science*. The committee, on which the Dominions Office and the Sudan government are represented, will report from time to time to the Secretary of State for the Colonies, and on all matters affecting research its recommendations will be referred to the Colonial Research Committee for comment and advice before submission to him.

Deaths in Other Countries

Henry Dreyfus, D.Sc., chairman and managing director of British Celanese Ltd., and known as a physician, chemist, industrialist and financier, died Dec. 30, 1944, a week before his sixty-third birthday.——**Sir Buckston Browne,** prominent physician and benefactor of the Royal College of Surgeons, died recently, aged 94.——**Sir Henry Gauvain,** since 1908 medical superintendent of Lord Treloar Cripples' Hospital and College, Alton and Hayling Island, died January 19.——**Dr. Frederick W. Eurich,** known for his work against anthrax, died in Southampton, England, February 16.

CORRECTION

Stiff Neck and Meningeal Irritation.—In THE JOURNAL, February 24, page 438, in the discussion of Dr. Toomey's paper by Dr. Hoyne, the statement that, "if the diagnosis is verified either by a blood culture or possibly by a smear from petechiae in the skin, usually a lumbar puncture is necessary" should read ". . . is not necessary."

Government Services

Jack Masur Succeeds Dean Clark

Jack Masur, surgeon, U. S. Public Health Service Reserve, has been appointed chief medical officer in the Office of Vocational Rehabilitation, Federal Security Agency, to succeed Dean A. Clark, senior surgeon, U. S. Public Health Service Reserve. Dr. Clark has been on leave of absence recently on a special project and will soon be transferred to a special assignment in the Office of the Surgeon General of the Public Health Service. Dr. Masur, who has been serving as assistant chief medical officer since April 1, 1944, had previously been assigned as hospital administration specialist to the U. S. Office of Civilian Defense. Victor H. Vogel, surgeon, U. S. Public Health Service, whose appointment as consultant in psychiatry was recently announced, has been assigned assistant chief medical officer.

Sale of Penicillin

Proposed procedure for gradual elimination of existing control over distribution of penicillin for civilian use and simultaneous diversion of the drug into normal trade channels for sale without restriction was outlined to the penicillin industry advisory committee at its recent meeting in Washington by Fred J. Stock, chief of the drugs and cosmetic branch, War Production Board. Mr. Stock made no promise as to the specific date on which the change would be undertaken, but it is understood that, barring unforeseen heavy demands by the military or some other unforeseen difficulty, it can become an accomplished fact within several months. According to *Drug Trade News*, Mr. Stock said he proposes to "release the brakes" gradually, retaining the existing Civilian Penicillin Distribution Unit, under John N. McDonnell, in Chicago, until it is certain that distribution is operating smoothly through trade channels. Penicillin production is now above the 400 billion unit mark each month, it was stated, and the 2,700 hospitals acting as distributing agents under the controlled distribution plan are now receiving about 35 billion units a month, the remainder going to the armed forces. Sufficient advance notice of the date of the change over from controlled distribution to distribution through usual trade channels would be given so that manufacturers can plan promotion campaigns, it was stated.

Graduate Work in Health Education

Fellowships for graduate work in health education are being offered to qualified applicants by the U. S. Public Health Service in cooperation with the National Foundation for Infantile Paralysis, Surgeon General Thomas Parran has announced. These fellowships for the collegiate fall term of 1945 are being awarded to meet present and future needs for trained health educators in schools, communities and local, state and federal health departments. Men and women between the ages of 22 and 40 who are citizens of the United States and who hold a bachelor's degree from a recognized college or university may apply. Fellowships will lead to a master's degree in public health. The twelve months training period will consist of nine months in the School of Public Health at the University of North Carolina, Yale University or the University of Michigan and three months' field experience in community health education under supervision. Applicants must meet the requirements for admission to the schools of public health. Training in science, sociology, education and psychology, plus experience working with people, are desirable prerequisites. The fellowships provide a stipend of $100 a month for twelve months, full tuition and travel for field experience. Candidates must pay their travel to and from the university at the beginning and end of training. "The existing shortage of trained health educators and the demand for expansion of health education activities indicated both in this country and abroad highlight the need for qualified personnel with a thorough understanding of both public health and education," the Surgeon General said. Basil O'Connor, president of the National Foundation for Infantile Paralysis, pointed out that coordination of official and voluntary agencies on a community basis will make available the services of competent health educators, whose aid will be invaluable in solving community health problems. He stressed the assistance to be given by such a group during an infantile paralysis outbreak in informing residents about the disease and the necessity for long continued after-care of patients. Fellowship application forms may be obtained from the Surgeon General, U. S. Public Health Service, Washington 14, D. C. Applications must be accompanied by a transcript of college credits and a small photograph and must be in the office of the Surgeon General not later than June 1.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Feb. 10, 1945.

How Science Saved Britain

Speaking at a meeting of the British Association for the Advancement of Science, Lord Woolton, minister of reconstruction, said that the policy of the British government during this century of giving little support to men of science had brought the country near defeat in the war. We remained unprepared either to breed a nation that would be physically fit or to grow and store enough food to ensure ourselves against the growing dangers of submarine warfare, which were known to our naval scientists. Within a few weeks of Lord Woolton's taking office in April 1940 as minister of food we were faced with a drop of 50 per cent in our food imports. We were saved from starvation by the application of scientific knowledge to the problem of securing the right foods, not to satisfy our appetites but to give us nutrition. At the same time scientific research applied to agriculture was making possible increase in the yield of land beyond expectations. Now in the sixth winter of the war, in which the scientist had played such a conspicuous part, our standards of health are well maintained and in many respects improved, while agriculture has been serving a great national purpose.

From the first, he pointed out, this has been a scientific war. In the early stages, used defensively, science helped to stave off defeat; now in the offensive stage it was making victory possible. Even more significant was the application of the scientific method in the operational field. Eminent scientists were found at the right hand of our military, naval and air strategists, applying to combat the same scientific methods which they used in peacetime research. They had been at work on problems of civil defense, combined operations, the defeat of U boats and even of operations on the battlefield. In the great experiment in reconstruction to be launched when the war is over the scientist can play a part as great as that which he has played in war. War experience on food and nutrition has provided many practical examples of what must survive in the postwar world. Thus, said he, we can save not only human suffering but millions of pounds a year previously wasted in physical ill health and consequent industrial incompetence.

Proposed Academy of Medicine

The three Royal Colleges—of Physicians, of Surgeons and of Obstetricians and Gynecologists—which represent the main divisions of the medical profession have originated independently at different periods and occupy different sites in London. In a letter to the *Times* a leading ophthalmic surgeon, Sir Stuart Duke-Elder, recalls that about two years ago he wrote advocating the unification of the many bodies which today represent the academic aspects of medicine and points out that the arguments then advanced have greater force today. It is eminently desirable that there should be an authoritative body which could uphold and foster the scientific progress of medicine, maintain professional standards, particularly at the consultant level, and stimulate research. In every liberated country of Europe which he visited Duke-Elder saw the eagerness with which the doctors and scientists look to Britain for a cultural lead to replace the hegemony hitherto exercised from Berlin. The creation of the center in London which could represent worthily all the academic aspects of medical practice would add much to our cultural and political influence.

The first essential step toward this unification would be to bring together on a common site the three Royal Colleges. There is an opportunity for this, as the Royal College of Surgeons has recently acquired the freehold of adjacent property. This would double their accommodations and allow sufficient space for the other two colleges. Duke-Elder urges that the present opportunity be seized and a substantial step forward be taken for founding an academy of medicine. His proposal has received impressive support from the leaders of the profession.

Lord Dawson, past president of the Royal College of Physicians and president of the British Medical Association, states that for many years the need of an academy of medicine has been felt in the profession in order to gather the Royal Colleges and the increasing number of specialties and other activities into a coherent whole. The principal specialties—orthopedics, radiology, anesthetics, otolaryngology and ophthalmology—have decided to make their homes on the new site acquired by the Royal College of Surgeons and are already settled there.

Sir Alfred Webb-Johnson, president of the Royal College of Surgeons, states that for some years the council has had in mind the desirability of forming an academy of medicine, and, in order to provide an opportunity for this, acquired adjacent sites, which are adequate for the requirements of all three colleges and the specialist associations. The council favors Lincoln's Inn Fields (where the college is) because of its advantages and amenities. Lincoln's Inn Fields is the largest square in London. It is a quiet area and has an academic atmosphere, which has been created by the legal society which has its home there. The location is central and accessible and is known throughout the world as the site of the famous Hunterian Museum. The college is prepared to put to common use its facilities—conference rooms, museums, laboratories and library. In support of Duke-Elder's plea Lord Horder says that the formation of an academy of medicine, apart from many obvious advantages to medicine, would enable the profession to speak with one voice where national interests are concerned.

Sir Thomas Barlow

Sir Thomas Barlow has died in his hundredth year. After a distinguished student's career he qualified in 1871. In 1876 he was appointed assistant physician to Charing Cross Hospital and in 1878 exchanged this post for a similar one at the London Hospital. In 1880 his old teachers at University College Hospital invited him to return as assistant physician. He was professor of clinical medicine at University College from 1895 to 1907. He was distinguished as a great clinical observer. He would spend much time on any case that presented a new combination of symptoms. Early in his career he published, in conjunction with Samuel Gee, another great clinician, a paper on cervical opisthotonos in which simple or basic meningitis (now known as meningoccic meningitis) was differentiated from tuberculous meningitis. Rickets was another disease on which he made important observations. With Lees he inquired into the relationship of congenital syphilis and rickets. They found that in 47 per cent of the cases in which craniotabes with bosses on the frontal and occipital bones occurred in rickets there was a certain history of congenital syphilis. At the International Congress of Medicine in 1881 he showed, in conjunction with Warner, the frequency and clinical significance of subcutaneous tendinous nodules in acute rheumatism of children. Their view that the nodules indicate concurrent and usually progressive heart disease was confirmed by other observers. He pointed out the parallelism between intermittent hemoglobinuria and the paroxysmal attacks of Raynaud's disease. He suggested that other visceral paroxysmal disorders might be found in these cases comparable to the temporary enlargement of the spleen sometimes found in hemoglobinuria. This suggestion he later verified. He is best known for his work on infantile scurvy. The disease had previously been described, but it was generally confounded with rickets. Barlow proved its identity with the scurvy of adults. His work so

impressed the Germans that they termed the condition "Barlow's disease." His work had an important effect on infant feeding at a time when artificial foods and sterilized milk were becoming popular. He was physician to three British sovereigns and the recipient of numerous distinctions. At the age of 87 he received in person the gold medal of the Royal Society of Medicine at its annual dinner. He was president of the International Medical Congress held in London in 1913.

British Casualties in the War Amount to a Million

The official report of British casualties in the fighting forces in the war from Sept. 3, 1939 to Nov. 30, 1944 has been issued. The total for the whole British Empire is 1,043,554. This consists of 282,162 killed, 80,580 missing, 386,374 wounded and 294,438 prisoners of war. Of the casualties 635,107 come from Britain, 78,985 from Canada, 84,861 from Australia, 34,115 from New Zealand, 28,943 from South Africa, 152,597 from India and 28,946 from the colonies. These figures are not the total casualties, for they exclude civilian casualties due to enemy action and casualties of merchant seamen.

BUENOS AIRES

(From Our Regular Correspondent)

Jan. 20, 1945.

National Department of Public Health

Dr. Manuel Augusto Viera, director of public health in Argentina, has officially described the laws pertaining to public health. The Department of Public Health will increase and improve the various centers of medical care, preventive medicine and general and preventive hygiene. People will have periodic medical examinations, free of charge. The results of these and the statistics of the conditions of health of the people will be made public. Dr. Viera states that the new subsidies will lead to a better national health service. Subsidies granted by the Central Department of Public Health to provincial health centers will be apportioned to the needs of the centers, which will be operated as branches of the central department, with due consideration to local autonomy. If the functions of public health centers are found to require more centralization, the regulations will be modified in accordance with the circumstances. Sanitary posts for administration of medical and preventive care will be established in isolated regions. The sanitary posts will be connected with regional hospitals, which in turn will be connected with larger specialized hospitals. Regional sanitary delegations have been established in Tucuman, Santa Fe, Mendoza and Bahia Blanca. The offices of international health, the office of coordination of passive antiair defense and the committee on the pharmacopeia and on alimentation will depend directly on the Central Department of Public Health.

Meeting of Industrial Physicians

The second meeting of industrial physicians was recently held in Buenos Aires under the auspices of the Instituto Argentino de Seguridad. Dr. Ismael Urbandt of the National Department of Public Health presided. Delegates were present from Brazil, Chile and Uruguay. Dr. César Corti Maderna, representing the board of officers of the Instituto Argentino de Seguridad, emphasized the importance of social medicine for workers and the importance of preventing accidents and diseases either general or industrial. Centers for medicosocial services have been organized and new centers are to be organized. The Instituto Argentino de Seguridad feels the importance of medical industrial congresses for the establishment of measures for the prevention of accidents, the recovery and reeducation of incapacitated workers after accidents and the orientation and training in trades suited for those who are incapacitated after accidents. Studies of workers with heart disease should be carried on to obtain information to serve as a basis for regulations to aid these persons.

Topics discussed at the meeting included brucellosis, silicosis, industrial hernia, dermatosis in metal burnishers, dermatosis from contact with bakelite, medical prevention of industrial dermatosis, observations on punctate erythrocytes of workers in industries which may lead to lead infection (Dr. Ismael Urbandt and Mario P. Francone), effort lumbago and protrusion of intervertebral disks. Other topics discussed included cardiac workers, psychologic problems and organization of industrial medicine. The importance of organizing an institute of industrial medicine and the need of providing proper laws and proper health insurance for industrial workers was emphasized.

Samples of Drugs

While Dr. Galli was director of public health in Argentina a law was passed prohibiting the giving of samples to physicians and hospitals by drug laboratories. The law met with disapproval. Liberal donation of samples is an old practice in the country and a good form of aiding poor patients in the hospitals. Dr. A. Viera, present director of public health, recently denounced the law. Distribution of samples of drugs as a donation of drug laboratories to physicians and hospitals is necessary to verify the claims concerning the pharmacologic effects and therapeutic uses of drugs. The Department of Public Health recently passed a new law requiring the exportation of drugs and the preparation of drugs to be exported to be supervised by the Department of Public Health.

Laws for Practice of Medical Specialism

According to recent action by the National Department of Public Health of Argentina specialists will be classified in the following medical branches: (*a*) urology, (*b*) gynecology, (*c*) dermatosyphilology, (*d*) otorhinolaryngology, (*e*) ophthalmology, (*f*) gastroenterology, (*g*) rheumatism, (*h*) pediatrics, (*i*) proctology, (*j*) endocrinology, (*k*) cardiology and circulatory diseases and (*l*) neurology and psychiatry. No other classification will be recognized.

South American Congress of Pediatrics

The first South American Congress of Pediatrics was held in Santiago, Chile, the last week of November 1944 with participation of Argentina, Bolivia, Chile, Peru and Uruguay. Drs. Andrade Marin of Quito, Ecuador, and Félix Hurtado of Havana, Cuba, were specially invited to the congress.

Marriages

ASHBEL C. WILLIAMS, Jacksonville, Fla., to Miss Kathleen Margaret Bainton Donaghue at Tavistock, Devon, England, December 24.

JAMES ALLEN MEADOWS JR., Birmingham, Ala., to Miss Mildred Evans Barnes of Andalusia, December 16.

KENNETH F. LAWS to Miss Betty J. Lahrman, both of Lafayette, Ind., at South Bend, November 9.

ROBERT O. PITTS III, Nashville, Tenn., to Miss Clementeene Pearson of Sarasota, Fla., December 23.

MURRAY P. WHICHARD, Murphy, N. C., to Miss Willietta Evans of Gulfport, Miss., December 26.

JOSEPH STOMEL to Miss Wilhelmina R. Gollum, both of Los Angeles in Yuma, Ariz., February 18.

THOMAS GRASTY BELL, Staunton, Va., to Miss Louisa Lile Tucker of Cleveland, December 24.

BELTON J. WORKMAN, Woodruff, S. C., to Miss Kathleen Bruton of Conway, December 27.

LEON L. RACKAW, Forest Hills, N. Y., to Miss Doris Starkman of Brooklyn, February 11.

FRANK W. FORDYCE to Mrs. Jessie Weese, both of Des Moines, December 27.

KATHRYN E. CAMPBELL, Boonville, Ind., to Lieut. John L. Susott, January 11.

Deaths

Lawrence Getz ✠ Ancon, Canal Zone; Johns Hopkins University School of Medicine, Baltimore, 1918; a first lieutenant in the medical corps of the U. S. Army in France from June 1917 to February 1919; interned at the City Hospital at Bay View, Baltimore; served as resident physician at the Hospital Santo Tomas, Panama, Republic of Panama, where he had been chief of the laboratory from 1926 to 1929 and again from 1942 until his death; assistant instructor in pathology at his alma mater and at the University of Maryland School of Medicine, Baltimore, 1923-1924; joined the staff of the Herrick Clinic and the Hospital de Panama in July 1929, serving until 1941; specialist certified by the American Board of Internal Medicine; fellow since 1929 of the American College of Physicians and governor of the college for Panama and the Canal Zone in 1941-1942; in 1928 president of the Medical Association of the Isthmian Canal Zone; member of the National Medical Association of Panama; in 1927 at the annual session of the American Medical Association in Washington, in collaboration with others, awarded a Bronze Medal for an exhibit illustrating the diagnosis, etiology and pathology of infection with Endameba histolytica, and at the 1934 session in Cleveland, also with others, the Class II Gold Medal for excellence of presentation of an exhibit illustrating diagnosis and pathology of human amebiasis; decorated with a diploma of Merit by the Republic of Ecuador; died in the Hospital Santo Tomas, Panama City, November 29, aged 52, of lymphosarcoma.

Elmer Lawton Kenyon ✠ Chicago; Rush Medical College, Chicago, 1896; retired in 1937 with the rank of associate clinical professor emeritus of laryngology and otology at his alma mater, where in 1910 he established the second clinic for disorders of the voice and speech in the United States; specialist certified by the American Board of Otolaryngology; one of the founders of the American Society for the Study of Disorders of Speech, now the American Speech Correction Association, of which he had been president from 1928 to 1932; president of the Chicago Laryngological and Otological Society in 1919, the Jackson Park Branch of the Chicago Medical Society, 1917-1918, and of the alumni association of Rush Medical College, 1922-1923; member of the American Laryngological Association; member of the House of Delegates of the American Medical Association in 1917; fellow of the American College of Surgeons; discovered the function of the extrinsic musculature of the larynx, in addition to various other contributions to this field; author of section "Defects of Speech of Congenital, or Developmental Origin" in Abt's Pediatrics, 1925; died February 1, aged 79, of cerebral hemorrhage and arteriosclerosis.

Mark J. Schoenberg ✠ New York; Universitatea din Bucuresti Facultatea de Medicina, Rumania, 1900; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology and the American Ophthalmological Society; founder and president of the New York Society for Clinical Ophthalmology; chairman of the committee on glaucoma of the National Society for the Prevention of Blindness; in 1914 received the Lucien Howe Medal of the Medical Society of the State of New York for essay on "Contribution to the Experimental Study of Ocular Anaphylaxis"; for many years instructor in ophthalmology at the Columbia University College of Physicians and Surgeons; served as consulting surgeon to the Manhattan Eye, Ear and Throat Hospital; consultant ophthalmologist at the Bronx Hospital and the Presbyterian Hospital; attending surgeon at the Herman Knapp Memorial Hospital for many years, serving as chief in the glaucoma clinic until his retirement as surgeon emeritus; member of the board of editors of the *Sight-Saving Review;* died in the Mount Sinai Hospital February 15, aged 70.

Thomas Aloysius Martin, New York; Columbia University College of Physicians and Surgeons, New York, 1900; member of the American Medical Association; fellow of the New York Academy of Medicine; member of the executive committee of the American Heart Association; formerly adjunct professor of therapeutics at the Fordham University School of Medicine and clinical professor of medicine at the New York University College of Medicine; served overseas with the Harlem Hospital unit of the U. S. Army during World War I; medical director and for many years visiting physician at St. Vincent's Hospital, where he was chairman of the school of nursing committee; on the staff and formerly medical director of the Harlem Hospital; on the staffs of the Columbus Hospital, French Hospital and New York Infirmary for Women and Children; died January 5, aged 71, of cerebral hemorrhage.

Albert Joseph Bertram, Miami, Fla.; Jefferson Medical College of Philadelphia, 1912; interned at the Lancaster General Hospital, Lancaster, Pa.; a licensed pilot; served as a director of the Greater Miami Airport Association and as chief starter for all the races in connection with the All American Air Maneuvers; member of the American Medical Association; commissioned lieutenant commander in the medical corps, U. S. Naval Reserve, on May 31, 1938 and commander (temporary) on July 13, 1942; aviation medical examiner and flight surgeon; served at Gaudalcanal, where he was wounded; the recipient of the Purple Heart; placed on the retired list as a result of physical disability on Feb. 14, 1944; died in the U. S. Naval Hospital, Bethesda, Md., Nov. 4, 1944; aged 53, of coronary thrombosis.

William Irving Wiggin ✠ Lowell, Mass.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1901; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology and the New England Otological and Laryngological Society; fellow of the American College of Surgeons; vice president of the Middlesex North District Medical Society; formerly instructor in laryngology at the Harvard Medical School, Boston; served overseas for eighteen months with a Red Cross unit during World War I; consultant surgeon, Massachusetts Eye and Ear Infirmary, Boston; on the staff of the Lowell General Hospital, where he died January 3, aged 65, of mesenteric thrombosis.

John Joseph Laughlin, Mount Carmel, Pa.; Georgetown University School of Medicine, Washington, D. C., 1935; interned at the Mercy Hospital in Wilkes-Barre; served a residency at the Ashland State Hospital, Ashland, and the Pennsylvania State Tuberculosis Sanatorium number 1 in South Mountain; commissioned a first lieutenant in the medical corps, Army of the United States, on Sept. 14, 1942 and served until relieved from active duty on Jan. 13, 1944; received a medical discharge on Feb. 4, 1944; assistant surgeon at the Bethlehem Steel Company, Sparrows Point, Md.; died in the Geisinger Memorial Hospital, Danville, December 2, aged 36, of carcinoma of the head of the pancreas.

Nathaniel Holder Adams ✠ Oak Park, Ill.; Northwestern University Medical School, Chicago, 1896; also a pharmacist; died January 20, aged 74, of respiratory paralysis due to amyotrophic lateral sclerosis.

Arthur Elmer Ballard, Belton, Texas; Fort Worth School of Medicine, Medical Department of Forth Worth University, 1905; member of the American Medical Association; director of the Central Texas Health unit; formerly officer of the Laredo-Webb County Health Unit; part owner of the Belton General Hospital; died in Lockhart December 30, aged 67, of heart disease.

Walter Herman Becker, Portland, Ore.; Willamette University Medical Department, Salem, 1907; died in the Good Samaritan Hospital December 27, aged 70, of coronary occlusion.

John William Henry Belote, Wills Point, Texas; University of Tennessee Medical Department, Nashville, 1901; member of the American Medical Association; died in Fort Worth, December 14, aged 77, of myocarditis.

Frederick Binder, Corning, Iowa; St. Louis University School of Medicine, 1911; member of the American Medical Association; chairman of the board of municipal utilities; died in the Clarkson Hospital, Omaha, October 17, aged 69.

John Ambrose Clark Busby, Oak Park, Ill.; University of Nebraska College of Medicine, Omaha, 1921; specialist certified by the American Board of Obstetrics and Gynecology, Inc.; member of the American Medical Association, Central Association of Obstetricians and Gynecologists, the Chicago Gynecological Society and the Oak Park Physicians' Club; senior member of the obstetric staff, West Suburban Hospital, where he died January 5, aged 51, of cerebral hemorrhage.

James W. Charters, Buffalo; University of Buffalo School of Medicine, 1895; for many years surgeon for the New York Central Railroad; member of the courtesy staff of the Millard Fillmore Hospital; died January 1, aged 74, of coronary thrombosis.

James Henry Clark, Montclair, N. J.; College of Physicians and Surgeons, New York, 1881; member of the American Medical Association; for thirty-four years police surgeon in Newark; for many years on the staffs of St. Michael's Hospital and the Hospital of St. Barnabas and for Women and Children in Newark; member of the William Pierson Medical Library Association and the Newark Historical Society; died January 1, aged 89, of chronic myocarditis.

Joseph Howard Cooper ✠ East Millstone, N. J.; Medico-Chirurgical College of Philadelphia, 1891; school physician; on the courtesy staff of the Somerset Hospital, Somerville, where he died December 31, aged 77, of coronary occlusion.

Robert Lee Downey, Monticello, Ark. (licensed in Arkansas in 1906); died December 16, aged 71, of injuries received in an automobile accident.

Edward Herman Eyerman ✠ St. Louis; St. Louis College of Physicians and Surgeons, 1898; on the staffs of the Lutheran and St. Anthony's hospitals; died January 2, aged 70, of coronary thrombosis.

James Francis Faulkner, New York; Harvard Medical School, Boston, 1913; member of the American Medical Association; decorated for service during World War I; died in the New York Hospital January 1, aged 60, of acute pyelonephritis of the remaining left kidney.

Henry Louis Field, St. Louis; Marion-Sims College of Medicine, St. Louis, 1891; died November 22, aged 84.

Reuben Harrison Fields, Gardiner, Ore.; Southern Homeopathic Medical College, Baltimore, 1897; member of the American Medical Association; served during World War I and as a member of the American Red Cross in Siberia; formerly on the staff of the Keizer Brothers Hospital, North Bend;. died December 9, aged 71, of coronary thrombosis.

Alexander D. Ghiselin Sr., Southbury, Conn.; Marion-Sims College of Medicine, St. Louis, 1894; veteran of the Spanish-American War; died January 6, aged 72, of heart disease.

George Harper Holt ✠ Cincinnati; Miami Medical College, Cincinnati, 1902; on the staffs of the Bethesda Hospital and the Christ Hospital, where he died December 31, aged 71, of diabetes mellitus.

Willoughby E. Kittredge, Napoleonville, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1899; died in New Orleans December 23, aged 71, of bronchopneumonia.

Eli French Knox, Lexington, Ky.; Hospital College of Medicine, Louisville, 1905; died in the Good Samaritan Hospital December 17, aged 77, of arteriosclerotic heart disease.

Lemuel Weyher Kornegay ✠ Rocky Mount, N. C.; North Carolina Medical College, Davidson, 1906; honorary member of the Medical Society of the State of North Carolina; a founder and chief surgeon of the Rocky Mount Sanitarium; died December 18, aged 63, of coronary occlusion.

Michael Saul G. Landa, New York; University of Dorpat Faculty of Medicine, Russia, 1900; member of the American Medical Association; died January 1, aged 70, of heart disease.

Martha A. McCullough Link ✠ Dubuque, Iowa; Milwaukee Medical College, 1909; died in the Mercy Hospital December 1, aged 59, of fibrosarcoma of the left shoulder.

William Franklin Lockwood, Edwardsburg, Mich.; the Hahnemann Medical College and Hospital, Chicago, 1894; died December 3, aged 80, of senility.

George Henry Martin, Pasadena, Calif.; Boston University School of Medicine, 1881; at one time professor of mental and nervous diseases at the Hahnemann Hospital College of San Francisco; died December 16, aged 85, of arteriosclerosis and senility.

Nall Carroll McCown, Forrest City, Ark.; Louisville and Hospital Medical College, Louisville, Ky., 1908; member of the American Medical Association; past president of St. Francis County Medical Society; served as city and county health officer; veteran of the Spanish-American War and World War I; died November 25, aged 61, of acute hepatitis.

Alfred Clifton McDaniel, San Antonio, Texas; Bellevue Hospital Medical College, New York, 1892; member of the American Medical Association; died in the Nix Hospital December 11, aged 78, of coronary occlusion.

Horace Walton McKim, La Belle, Mo.; College of Physicians and Surgeons, Keokuk, Iowa, 1887; died in the Blessing Hospital, Quincy, Ill., December 12, aged 79, of chronic interstitial nephritis.

Ransley Jacob Miller ✠ Topeka, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1913; served in France and Germany during World War I; served as acting health officer of Topeka; city physician; died in Christ's Hospital December 16, aged 55, of coronary occlusion.

Verlando Ziegler Miller, Brookville, Ohio; Starling Medical College, Columbus, 1896; died December 23, aged 83, of senility and coronary occlusion.

James M. Ogle, Frisco, Texas (licensed in Texas under the Act of 1907); served as mayor of Frisco; died December 10, aged 74, of coronary occlusion.

Fermin Ralph Orella, San Francisco; Cooper Medical College, San Francisco, 1892; member of the American Medical Association; fellow of the American College of Surgeons; formerly on the staff of the French Hospital; died in St. Francis Hospital December 4, aged 76, of arteriosclerotic heart disease.

Frank Diah Peterson, Cutchogue, N. Y.; College of Physicians and Surgeons, New York, 1891; member of the American Medical Association; formerly coroner and health officer of Southold; served on the staff of the Eastern Long Island Hospital, Greenport; died December 27, aged 75, of chronic nephritis and arteriosclerosis.

Vinton Joel Rickerd, Charlotte, Mich.; Starling Medical College, Columbus, 1896; member of the American Medical Association; died December 27, aged 68, of coronary thrombosis.

George Allen Ricketts, Osceola Mills, Pa.; Jefferson Medical College of Philadelphia, 1908; member of the American Medical Association; served as president of the board of education of Osceola Mills; fellow of the American College of Physicians; chief of medical staff, State Hospital, Philipsburg; died December 6, aged 71, of cerebral embolism.

Elmo Ray Royer ✠ North Salem, Ind.; Physio-Medical College of Indiana, Indianapolis, 1903; served during World War I; died in the Methodist Hospital, Indianapolis, December 31, aged 69, of pericarditis and myocarditis.

William Fred Scott ✠ Maywood, Ill.; Rush Medical College, Chicago, 1892; formerly clinical professor of surgery at Loyola University School of Medicine, Chicago; in 1939 the members of the staff of the Oak Park Hospital, Oak Park, presented an oil portrait of him to the hospital, where for many years he was chief of staff; died January 18, aged 75, of coronary occlusion.

Walter Augustus Shaw, Springfield, Mass.; Baltimore Medical College, 1906; for many years a school physician; a member of the staff of the Wesson Memorial Hospital; died in the Springfield Hospital December 23, aged 65, of hypostatic pneumonia, decompensated heart disease and coronary sclerosis.

Ulysses S. Leroy Shirkey, Cleveland; Columbus Medical College, 1891; died January 8, aged 82, of coronary thrombosis.

Fred Alexander Snowden, Batavia, N. Y.; New York University Medical College, 1898; member of the American Medical Association; formerly coroner of Westchester County and health officer of Peekskill; head of the x-ray department of the Genesee Memorial Hospital; died January 6, aged 67, of cerebral hemorrhage.

Silas Jackson Stottlemyer ✠ Anderson, Ind.; Bennett Medical College, Chicago, 1911; formerly coroner of Madison County; on the staff of St. John's Hospital, where he died January 3, aged 65, of essential hypertension and cerebral hemorrhage.

Calvin Guy Stricklin, Clarendon, Texas; Baylor University College of Medicine, Dallas, 1914; member of the American Medical Association; died in the Northwest Texas Hospital, Amarillo, December 2, aged 59, of coronary occlusion.

Evangeline Wilson Young, Framingham, Mass.; Tufts College Medical School, Boston, 1906; died December 20, aged 70, of cerebral hemorrhage.

Abraham Mason Zaring, Louisville, Ky.; Hospital College of Medicine, Louisville, 1898; died in St. Joseph Infirmary December 28, aged 74, of pneumonia and nephritis.

PUBLIC HEALTH SERVICE

Stephen Andrew DeMartini ✠ Senior Surgeon, U. S. Public Health Service, Cleveland; College of Physicians and Surgeons, Baltimore, 1915; captain in the medical corps of the U. S. Army during World War I, in charge of a military unit in France; served in the U. S. Public Health Service Reserve, being commissioned in 1930 to the rank of surgeon in the regular corps; in 1939 promoted to the rank of senior surgeon; for many years served for varying periods at U. S. Marine hospitals at Port Townsend, Wash., Chelsea, Mass., and Stapleton, N. Y.; on Aug. 26, 1936 transferred to the U. S. Marine Hospital in Cleveland, where he was chief of the surgical service and where he died December 23, aged 57, of coronary thrombosis.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Broken Steel Drill Left in Humerus to Serve as Peg.—The patient suffered a transverse comminuted fracture of the humerus of his right arm. The physician to whom he went tried unsuccessfully twice within four days to reset the fractured bone. The defendant physician, Whittaker, was then called into the case and on March 12, 1935 performed an open reduction and thereafter seems to have rendered necessary postoperative care. Some weeks later, when it appeared that there was not enough callous formation to form a union, a bone graft became necessary and was performed June 19. In performing that operation it was necessary to attach a graft taken from the plaintiff's right tibia to the severed parts of the broken bone in the arm, and Whittaker planned to accomplish this by using four ivory screws, two above the break and two below. To insert the ivory screws it was necessary to use a steel drill to bore four holes through the graft bone and into the humerus in which the screws could be set. This was accomplished as to three of the ivory screws; but in boring the fourth hole the steel drill was broken, and a portion of the drill about 1½ inches long, which extended through the graft bone and into the humerus, was allowed to remain. There was undisputed medical testimony that in so doing the physician was using his judgment in determining whether it would be better for the patient and the success of the operation to remove the broken portion of the drill or to allow it to remain in the bone and to serve the purpose of an ivory screw. Further, there was undisputed medical testimony that for the purpose of fixation of a graft bone to an injured member other means than ivory screws are used and that such practice is proper. After this last operation the patient continued under the physician's care until some five years later. The physician from time to time dressed the injured member and applied different types of slings or casts to hold the arm in place. The patient suffered from pain, and by December 1935 a small sinus developed from which pus exuded intermittently until September 1940, when the patient removed from the sinus with a pair of tweezers a piece of the broken steel drill. Three months later one of the ivory screws used in the bone graft procedure also came out from the site of the incision. Soon thereafter the plaintiff's condition improved and the pus drainage gradually subsided and then ceased. Subsequently the patient instituted action for malpractice against the physician, charging lack of proper care on the part of the physician and a lack of exercise of good judgment and professional skill in leaving the broken portion of the drill in his arm. There was no medical expert testimony adduced in support of his claims, and as the trial developed it became apparent that the claim of negligence was confined to the leaving of the broken drill in the bone. At the close of all the evidence the trial court directed a verdict in favor of the physician because there was no competent testimony to support the claim that the leaving of the drill in the bone constituted malpractice. The patient then appealed to the Supreme Court of Michigan.

The patient contended that, notwithstanding his failure at the trial to sustain his claim of malpractice on the part of the physician by the testimony of any medical witness, he was nevertheless entitled to go to the jury on the record made by his own testimony, relying on *Balance* v. *Dunnington*, 241 Mich. 383, 219 N. W. 329, and *LeFaive* v. *Asselin*, 262 Mich. 443, 247 N. W. 911. The syllabus in the LeFaive case read as follows:

> In action for malpractice, based on surgeon's failure to remove needle after performing operation for appendicitis, it was not necessary for plaintiff to show by expert witnesses that it was not good practice to sew up incision without removing needle.

Authority will be found, said the court, in support of the proposition that under certain circumstances, such as disclose to the mind of the layman failure to perform professional duty properly, there may be a recovery in malpractice cases notwithstanding no expert testimony is produced in support of the claim of the patient. But, in our opinion, these holdings constitute an exception to the general rule that malpractice may ordinarily be proved only by the testimony of those skilled in the particular field in which the malpractice is charged to have occurred. Our review of the record in this case, however, brings the conclusion that this case does not fall within that exception. While the patient charges a lack of proper care and a lack of exercise of good judgment and professional skill in leaving the broken drill in his arm, he did not offer in support of this claim any expert testimony such as is required in cases of this character. Nor was any such testimony developed on the cross examination of the medical witnesses who testified for the physician. Clearly the question as to whether or not proper care and attention was given by the physician at any time after his services to the patient first began is an issue requiring expert testimony for its determination. And likewise whether the physician in using his judgment in leaving the broken piece of the drill in the patient's arm to serve in lieu of an ivory screw to hold the bone splint in place was such a breach of professional duty as under the circumstances constituted malpractice could be determined only from the testimony of medical experts. But in this record there is no competent testimony of lack of proper care; and each of several experts as defendant's witnesses testified in substance that defendant's use of his judgment in leaving the broken piece of drill in plaintiff's arm to serve in lieu of an ivory screw was, under the circumstances, in accordance with the usual and ordinary practice of physicians and surgeons in the community skilled in the art of bone surgery. On this phase of the case in response to a question of the foregoing purport an orthopedic surgeon and a professor of surgery in the University of Michigan Medical School testified:

> My answer to that would be, it rests entirely on the judgment of the doctor. My answer is, it was a practice which is the custom and one which is good, which was followed.

Accordingly the judgment in favor of the physician was affirmed.—*Zanzon v. Whittaker, 17 N. W. (2d) 206 (Mich. 1945).*

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, March 3, page 542.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Part III. Various centers, June. Exec. Sec., Mr. E. S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral.* New York, June 13-17. Final date for filing application is March 15. Sec., Dr. Paul M. Wood, 745 Fifth Ave., Room 1503, New York 22.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: New York, June 8-9. Final date for filing application is March 12. Sec., Dr. George M. Lewis, 66 E. 66th St., New York 21.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Oct. 15. Final date for filing application is Aug. 1. Candidates in the armed forces may take the examination at their station with the permission of their medical commanding officer. Asst. Sec., Dr. W. A. Werrell, 1301 University Ave., Madison 5, Wis.

AMERICAN BOARD OF OBSTETRICS & GYNECOLOGY: *Part II. Oral.* Atlantic City, June 13-19. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 6.

AMERICAN BOARD OF OPHTHALMOLOGY: New York, June 13-16; Chicago, Oct. 4-5; and Los Angeles, January. Sec., Dr. S. Judd Beach, 56 Ivie Rd., Cape Cottage, Me.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part I. Oral and Written.* New Orleans, Sept. 28-29, New York, Oct. 5-6, Chicago, Oct. 12-13 and San Francisco, Oct. 19-20. Final date for filing application is August 1. Sec., Dr. G. A. Caldwell, 3503 Prytania St., New Orleans 15.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 3-6. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City, Ia.

AMERICAN BOARD OF RADIOLOGY: *Oral.* New York, June 3. Final date for filing application is May 1. Sec., Dr. B. R. Kirklin, 102-110 Second Ave. S.W., Rochester, Minn.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Archives of Otolaryngology, Chicago

40:433-530 (Dec.) 1944

Nasal Septum: Plastic Repair of the Deviated Septum Associated with a Deflected Tip. A. P. Seltzer.—p. 433.
Cystadenoma of Larynx: Report of 4 Cases. F. A. Figi, W. D. Rowland and G. B. New.—p. 445.
*Surgical Treatment of Atrophic Rhinitis. L. W. Eisenstodt.—p. 451.
Mechanisms of Ocular Movement in Man: Influence of Vestibular Apparatus. H. B. Perlman and T. J. Case.—p. 457.
Aviation Deafness. P. W. Malone.—p. 468.
The Aging Ear. E. P. Fowler.—p. 475.
Sulfonamide Compounds in Treatment of Infections of Nasal Sinuses. E. J. Whalen.—p. 481.
Bronchial Adenoma with Metastasis. H. I. Laff and K. T. Neubuerger. —p. 487.
Epiphora of Nasal Origin: Simple Method of Treatment. G. E. Tremble. —p. 494.
Thrombophlebitis of a Cavernous Sinus Following Extraction of Teeth: Cure with Penicillin and Heparin. I. H. Wiesenfeld and E. Phillips. —p. 497.
Progress in Otolaryngology: Summaries of the Bibliographic Material Available in the Field of Otolaryngology: Otitis Media and Complications. B. R. Dysart.—p. 504.

Surgical Treatment of Atrophic Rhinitis.—Eisenstodt advocates an operation in which only preserved septal cartilage is employed. The cartilage is obtained from patients on whom submucous resection has been performed and is thus free of perichondrium. The cartilage is washed in sterile saline solution and is stored in 70 per cent alcohol. The principle of the operation, as in all the previous ones, is to diminish the air space in the nose, in addition to diminishing the quantity of air entering the nose. Preserved septal cartilage may be implanted on each side of the cartilaginous and bony nasal septum without necrosis of the mucoperichondrial flaps. Patients with moderate atrophic rhinitis and those with ozena obtain immediate relief from this procedure. The results are better if, in addition to transplanting preserved septal cartilage into the septum, a rhinoplasty is performed. The associated atrophy of the upper respiratory tract is also improved by the advocated nasal operation.

Journal of Nutrition, Philadelphia

28:383-460 (Dec.) 1944

Study of Plasma Ascorbic Acid Values with Relation to Type of Diet Used in Puerto Rico by Groups of Individuals of Widely Varied Economic Status. H. E. Munsell, A. Maria Cuadros and R. M. Suárez.—p. 383.
Dietary Anemia in Pigeon. H. R. Street.—p. 395.
Complex Carbohydrates of Some Chinese Foods. L. C. Kung.—p. 407.
Variation in Ascorbic Acid Requirements for Saturation of 9 Normal Young Women. Alice B. Kline and Mary S. Eheart.—p. 413.
*Effect of Spray Drying and Subsequent Storage of Dried Product on Vitamin A, D and Riboflavin Content of Eggs. C. A. Denton, C. A. Cabell, H. Bastron and R. Davis.—p. 421.
*Vitamin C Content of Wild Greens. H. C. Murray and R. Stratton. —p. 427.
Study of Canine Hysteria Produced by Feeding Certain Baked Dog Foods and Wheat Gluten Flour. J. R. Wagner and C. A. Elvehjem. —p. 431.
Atwater System of Calculating Caloric Value of Diets. L. A. Maynard. —p. 443.

Effect of Spray Drying on Vitamin Contents of Eggs.—Denton and his associates estimated the vitamin A content of emulsified and spray dried eggs by biologic and spectrophotometric methods, the vitamin D content by a biologic method and the riboflavin by a microbiologic method. The results indicate that no loss of these vitamins occurred during the spray drying process. Vitamin D and riboflavin are stable in the stored dried products, whereas vitamin A is lost fairly rapidly, especially at higher storage temperatures.

Vitamin C Content of Wild Greens.—Murray and Stratton point out that a number of native wild plants are useful additions to wartime diets as greens or salad plants. They report assays of the vitamin C content of a number of the commonest of these edible wild plants, the tests involving both fresh samples, those which had been placed in frozen storage for several weeks before testing and those which had been cooked. It was found that pokeweed, tall dock and curley dock contained twice as much vitamin C as spinach; poverty weed, shepherd's purse and lamb's quarter about as much as spinach; chickweed, dandelions and prickly lettuce considerably less than spinach. Loss of vitamin C in wild greens due to freezing or cooking was comparable to the loss sustained under similar conditions by cultivated greens. There was some indication that the vitamin C content was greater in plants exposed to full sunlight and in fertile, uncultivated soil.

New York State Journal of Medicine, New York

44:2639-2764 (Dec. 15) 1944

Symposium: Etiology, Diagnosis, Treatment and Prognosis of Essential Hypertension: Medical Treatment of Uncomplicated Hypertensive Vascular Disease. D. W. Atchley.—p. 2683.
Observations on Certain Less Well Established Investigations on Hypertension. I. H. Page.—p. 2686.
Ocular Fundi in Essential Hypertension, Pre- and Postoperative. H. S. McKeown.—p. 2692.
Surgical Treatment of Hypertension: Some Circumstances Under Which Lumbodorsal Splanchnicectomy Appears to Be Inadvisable in Hypertensive Patients. R. H. Smithwick.—p. 2693.
Biochemical Factors Influencing Wound Healing. M. Bruger.—p. 2701.
War Wounds of Colon and Rectum. J. E. Hamilton.—p. 2706.

Public Health Reports, Washington, D. C.

59:1603-1634 (Dec. 15) 1944

Pathologic Reactions in Guinea Pigs to the Humphreys' Virus Strain. T. L. Perrin and E. A. Steinhaus.—p. 1603.
Notes on State Legislative Provisions for Temporary Licensing of Physicians. Adela Stucke.—p. 1609.
*Infectious Hepatitis: Experimental Study of Immunity. J. W. Oliphant. —p. 1614.

Immunity in Infectious Hepatitis.—Oliphant points out that homologous serum jaundice and infectious hepatitis clinically and pathologically are indistinguishable. However, the incubation period of spontaneous infectious hepatitis is about thirty days; that of homologous serum jaundice is usually much longer. This is unexplained. The author presents studies which indicate that recovery from homologous serum jaundice results in immunity to reinoculation with serum from acute cases of infectious hepatitis or with icterogenic yellow fever vaccine, and that the immunity persists for at least twelve to eighteen months. Pooled serums from 2 patients, drawn one to three months following recovery from homologous serum jaundice, when mixed with icterogenic serum failed to protect 1 of 10 persons inoculated with this mixture.

59:1635-1660 (Dec. 22) 1944

*Studies on Neuromuscular Dysfunction: I. Neostigmine Therapy of Neuromuscular Dysfunction Resulting from Trauma. II. Neostigmine Therapy of Hemiplegia, Facial Paralysis and Cerebral Palsy. III. Neostigmine Therapy of Chronic Rheumatoid Arthritis and Subacromial Bursitis. H. Kabat.—p. 1635.

59:1661-1692 (Dec. 29) 1944

Relative Resistance to Escherichia Coli and Eberthella Typhosa to Chlorine and Chloramines. Elsie Wattie.—p. 1661.
Studies of Antigens in Infected Yolk Sacs. M. J. Shear.—p. 1671.

Neostigmine Therapy of Neuromuscular Dysfunction.—Kabat employed neostigmine therapy in a variety of types of neuromuscular dysfunction. Patients selected were those with muscle spasm, contracture, paresis or muscular pain in whom there was no evidence of psychiatric involvement and in whom the disability had existed for a considerable time. These patients had had no spontaneous exacerbations or remissions and were either not improving or improving so slowly that the effect of therapy could be evaluated. The disability was not complicated by demonstrable anatomic lesions such as ankylosis,

bony block, complete loss of innervation or active inflammation. Neostigmine was injected subcutaneously once or twice daily. The routine dose was 2 cc. of neostigmine methylsulfate 1:2,000 solution (1 mg.) together with atropine sulfate 1/100 grain (0.65 mg.) or 1/150 grain (0.43 mg.). The atropine was used to eliminate the unpleasant parasympathetic side effects of the neostigmine. Observations on 53 patients under this treatment revealed that improvement in range of motion, relief from pain and increase in strength and endurance may occur rapidly in cases of disability following trauma of hemiplegia and related neurologic conditions and of chronic rheumatoid arthritis and subacromial bursitis. The results have been encouraging enough to warrant further investigation. The mechanism of action of neostigmine in relaxation of muscle spasm or contracture, in relief of muscle, joint or nerve pain and in increasing the power of voluntary contraction of paretic muscles is not established. The inhibitory action of neostigmine on cholinesterase at the synapses in the central nervous system, as well as at the myoneural junction, may be of importance. Since the action of neostigmine on the central nervous system in man is inhibition of muscle tonus and the deep reflexes, it appears likely that the relaxation of muscle spasm is a manifestation of the central action of the drug. Such a central inhibitory action on muscular hypertonus is apparently effective regardless of whether the hypertonus is of peripheral origin, as in cases of trauma or arthritis, or of central origin, as in poliomyelitis and hemiplegia.

Southern Medical Journal, Birmingham, Ala.

37:679-746 (Dec.) 1944

The Public's Obligation to the Medical Profession. J. A. Ryan.—p. 679.
Early Postoperative Walking: Superiority of Wire Sutures. J. W. Nixon. —p. 682.
Pathologic Lesions in Brain in Malaria. R. H. Rigdon.—p. 687.
Case of Probable Meningococcus Endocarditis Apparently Cured with Penicillin. S. L. Zimmerman and R. N. Barnett.—p. 694.
Acute Coronary Occlusion Associated with Paroxysmal Auricular Fibrillation: Report of Case. W. D. Stubenbord.—p. 696.
Hypertensive Encephalopathy: Clinical Consideration. A. McNitt.—p. 698.
Human Intestinal Parasites in West Virginia Tuberculosis Institution. W. J. Habeeb.—p. 701.
Tuberculosis and Hyperthyroidism: Report of Case. S. Jacobs.—p. 703.
Newer Developments in Syphilis Therapy. L. J. Alexander and A. G. Schoch.—p. 705.
Acute Infectious Polyneuronitis. J. M. Blumberg, V. P. Mahoney and S. U. Wenger.—p. 708.
Hyperinsulinism. S. Harris Jr.—p. 714.
Intestinal Perforations Due to Nonpenetrating Abdominal Trauma. J. R. Bunch.—p. 717.
Vesicovaginal Fistulae. W. H. Vogt.—p. 723.
Microsedimentation in Children. C. C. McLean.—p. 726.
*Urticaria Due to Inhalant Substances: Phenomenon Rarely Appreciated. V. J. Derbes and H. T. Engelhardt.—p. 729.

Urticaria Due to Inhalants.—Derbes and Engelhardt report 2 cases in which urticaria resulted from inhalant substances. 1. A woman aged 42 had ragweed hay fever for six years. After the ragweed pollen had been in the air for a week or ten days, urticarial wheals began to appear. These were first noticed as erythematous areas on the face, and later diffuse edema of the face and generalized hives became manifest. These hives persisted throughout the ragweed season every year. This year, when the hay fever was adequately controlled by preseasonal treatment, the patient remained free also from urticaria. Every one who has administered various therapeutic extracts in desensitizing allergic patients recognizes that systemic reactions characterized by urticaria are by no means rare. 2. A boy aged 11 had ragweed asthma for three years. During this period exposure to the fumes of fresh paint invariably produced an attack of asthma associated with urticaria. The onset of both is within fifteen or thirty minutes after exposure. It is of interest that whereas the attacks of asthma are over within twenty-four hours, the urticaria persists three or four days after this momentary stimulus. Cases in which inhalant substances are the cause of urticaria are common and many more of them would be discovered if this mechanism was borne in mind in attempting to diagnose chronic urticaria. Sulzberger lists feathers, pollens, animal danders, orris root insecticides and sprays, ephedrine and other nasal sprays as well as various dusts and dyed materials of all descriptions as common inhalant causes of urticaria.

United States Naval Med. Bulletin, Washington, D. C.

43:1085-1312 (Dec.) 1944. **Partial Index**

Eye Replacement by Acrylic Maxillofacial Prosthesis. P. J. Murphey and L. Schlossberg.—p. 1085.
Tantalum in Immediate Repair of Traumatic Skull Defects: Method of Immobilizing the Wounded Brain. W. J. Gardner.—p. 1100.
Traumatic Hemothorax. J. D. Cuono.—p. 1107.
Achalasia in Military Service: Treatment and Disposition. R. R. Hoffman.—p. 1111.
Pterygium Transplantation by Simplified Method. M. Gurley Jr.—p. 1114.
*Cold Hemagglutination Test in Diagnosis of Primary Atypical Pneumonia. A. A. Humphrey.—p. 1117.
Cold Agglutination Test: I. Studies on Naval Hospital Patients. II. Studies on Natives in Yaws Endemic Area. G. H. Fetterman, T. J. Moran and W. R. Hess.—p. 1128.
Mental Mechanisms and Morale Factors of Naval Recruits in Training. C. N. Baganz, R. J. Mearin and W. A. Woods.—p. 1137.
Cerebral Symptoms in Malaria. S. McGinn and J. T. B. Carmody. —p. 1157.
Hippuric Acid Liver Function Test in Relation to Malaria and Atabrine. J. K. McCorkle.—p. 1163.
Acute Infective Jaundice and Acute Hepatitis: 360 Cases at an Advance Base. M. I. Cohen.—p. 1166.
Observations on Malaria. D. A. Weeks.—p. 1171.
*Pathogenic Enteric Bacilli: III. The Shigella Group. L. A. Barnes. —p. 1178.
Dermatologic Conditions Prevalent in Tropical Areas: Treatment with Heavy Dosage of Ultraviolet Ray. K. Phillips and V. B. Buhler. —p. 1193.
Chemotherapy of X-Ray Radiation in Treatment of Cellulitis of the Head and Neck. S. S. Wald.—p. 1200.
Treatment of Skin Diseases on an Attack Transport: Use of Undecylenic Acid. W. J. McCann.—p. 1205.

Cold Hemagglutination Test in Primary Atypical Pneumonia.—Humphrey studied the reaction to the cold autohemagglutination test by 14 patients diagnosed as having primary atypical pneumonia. Of the 14 all but 1, or 93 per cent, showed positive reactions. No strong reaction was noted in a series of 80 controls who were largely patients with upper respiratory and pulmonic diseases. The first positive reactions were noted within four to eight days of the onset, but in instances the reaction might be delayed until the early part of the third week. The maximum titer usually occurred between the sixteenth and twenty-third days of illness and with but rare exception became weak or negative between the thirty-fifth and forty-fifth days. Clinically there was little relationship between the titer and the fever, although some parallelism existed between the test and the sedimentation rate and the x-ray findings. While the x-ray examination is often confirmatory, other laboratory aids, such as the sedimentation rate and leukocyte count, have proved to be of little value in the diagnosis. It seems probable that the only procedure with any degree of specificity for the disease may be the cold autohemagglutination test. A disadvantage is the fact that the test is not consistently positive in the first week of the illness. However, most of the agglutination reactions for other diseases are positive no earlier.

Shigella Group of Enteric Bacilli.—An organism that is a nonmotile, gram negative, non-spore forming rod, fails to produce hydrogen sulfide, does not utilize citrate or liquefy gelatin, does not produce acetylmethylcarbinol or hydrolyze urea and ferments glucose without gas formation (with two exceptions) but fails to ferment salicin may be suspected of belonging to the Shigella group. There are three major points of differentiation between the Shigellas and the Salmonellas. The Shigellas are nonmotile, do not produce hydrogen sulfide and fail to form gas, whereas the majority of species of the Salmonellas are actively motile, produce large amounts of hydrogen sulfide and form large amounts of gas in the carbohydrate mediums. The lines of demarcation are not so sharp between the Shigellas and certain anaerogenic species of the paracolon and proteus groups. The present trend is to discard the older terms Bacillus dysenteriae, Bacillus paradysenteriae and the like for the more correct generic designation of Shigella, together with the type specific names. The genus Shigella comprises 20 species of medical importance that are fairly well differentiated by biochemical and serologic means; in addition there is a heterogeneous group formerly known as Bacillus dispar that has not been studied sufficiently to permit a species differentiation. The Shigella organisms enter the body through the ingestion of food or drink contaminated by the feces of patients or carriers. Nearly 3 per cent of convalescent carriers may excrete the organisms for more than three months. A

significant percentage of convalescent carriers may remain dangerous for a year. In acute dysentery stool cultures will usually yield the causative organisms, provided the specimens are obtained early in the disease and are subjected to laboratory examination within a short time after passage. In carrier surveys or in chronic conditions the rectal swab specimen is to be preferred. The specimen should be cultured on S-S (Salmonella-Shigella) agar plates. The most effective means of serologic diagnosis is through the use of absorbed, type specific antiserums for their reactions on pure cultures isolated from fecal specimens. Efforts should be made to detect and isolate individuals excreting the organisms. The evidence incriminating flies in dissemination renders their control imperative. The prophylactic use of vaccines has been hampered by the lack of adequate data on the distribution of the various types of Shigella throughout the world, but recent developments have rendered the specific diagnosis of shigellosis relatively simple. It is possible that the prophylactic use of the sulfonamides may prove to be of value in control measures.

Virginia Medical Monthly, Richmond

71:603-654 (Dec.) 1944

*Burns: Review of Cases Treated in Overseas Army General Hospital. B. J. Rawles and J. R. Massie.—p. 605.
Perinephric Abscess. J. H. Lyons.—p. 610.
Continuance of Symptoms After Surgery of Biliary Tract. E. T. Trice. —p. 614.
Feeding Problems in Infants. I. C. Grant.—p. 623.
Public Health. I. C. Riggin.—p. 627.

Burns Treated in Overseas Army General Hospital.—Rawles and Massie list as fundamentals in the treatment of burns (*a*) the prevention and control of shock, (*b*) the relief of pain, (*c*) the prevention and control of infection and (*d*) the prevention of contracture and excessive scarring by proper splinting and early skin grafting. The local surface treatment should be limited to a minimum amount of débridement and cleansing and, finally, the burned area should be covered with sterile petrolatum or, if this is not available, with boric acid ointment. A firm pressure dressing should be applied over this, which should not be changed for ten to fourteen days unless complications arise. The authors review observations on 78 patients with burns. Forty-two of the patients were grafted, a total of 63 operations being done. The preparation of third degree burned areas for grafting was often a real problem when much secondary infection was present. Dressings wet with isotonic solution of sodium chloride with fine mesh gauze next to the granulating wounds were applied on admission in nearly all cases, since an average time of thirty days had elapsed in those cases in which grafting was necessary. Slough was removed by sharp dissection if necessary. The skin around the wounds became macerated from the moisture, and since it had been felt that the dead débris probably acted as a culture medium this was cleaned away with neutral soap and water. All patients were given a high protein diet, multivitamins and iron. A patient was not considered ready for skin grafting unless the plasma proteins were above 6.5 Gm. per hundred cubic centimeters and the red blood cell count was 4,000,000 or above. Fifteen of the 39 patients grafted received blood or blood plasma to bring their readings above the minimal levels. Split grafts are the best type from the standpoint of preventing further scar tissue and for furnishing a durable skin surface. They were used in 54 of the 63 operations. Pinch grafts were used in the other 9. In a few of the extensive wounds in which it was difficult to cut enough split grafts, pinch grafts were used to fill in gaps. Grafts were sutured in place with a slight overlap at the edges with a continuous suture of fine silk. Fine mesh gauze impregnated with an ointment was placed next to the grafts. Sterile gauze and mechanics' waste was next applied and an Ace bandage for pressure. In the case of extensive burns in which almost an entire extremity had to be grafted the percentage of takes was from 95 to 100. Poor results were obtained in the cases with relatively small granulating wounds which had been neglected because they were small, with the hope that they would heal over without grafting. As a result, scar tissue formed in the bed, which often did not prove to be a fertile field. This should bring home the necessity of covering the smallest of granulating wounds with epithelium.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:617-650 (Nov. 11) 1944

*Acute Perforated Peptic Ulcer: Frequency and Incidence in West of Scotland. C. F. W. Illingworth and L. D. W. Scott.—p. 617.
Episiotomy. J. D. S. Flew.—p. 620.
Rapid Replacement of Fluid in Hemorrhage and Shock. J. D. P. Graham.—p. 623.
Underwater Blast Injuries of Abdomen. T. Moore.—p. 626.
Toxic Reactions After Administration of Paraldehyde. R. E. Hemphill and H. Heller.—p. 628.

2:651-682 (Nov. 18) 1944

Studies on Hepatic Dysfunction: II. Value of Sulfur-Containing Amino Acids and Casein Digest in Prevention of Postarsphenamine Jaundice. J. Beattie and J. Marshall.—p. 651.
*Acute Perforated Peptic Ulcer: Frequency and Incidence in West of Scotland. C. F. W. Illingworth, L. D. W. Scott and R. A. Jamieson.—p. 655.
Experiences with Giant Magnet and Metallic Intraocular Foreign Bodies in Recent Battle Casualties: R. E. Wright and H. A. G. Duncan. —p. 658.
Latent Mastoiditis in Infancy. W. H. Patterson and G. Stewart Smith. —p. 659.
Secondary Abdominal Pregnancy. F. E. Stock.—p. 661.

Perforated Peptic Ulcer.—Illingworth and his associates obtained records of all perforations treated in hospitals of over 15 beds in the West of Scotland and in private practice during the year 1943. From 1924 to 1938 there was a progressive increase in the incidence of perforations. During the war the steady increase has been interrupted by a great rise in 1940-1941 followed by a return to a lower level. These changes almost entirely concern duodenal ulcer. The 1940-1941 rise was not correlated with air raids in this part of the country. It is suggested that, in addition to anxiety about the war situation, overwork and perhaps undernutrition may have exerted an influence. The sex ratio has undergone little change during the twenty year period. The rise in 1940-1941 and the fall in 1941-1942 were confined to men. Perforation is rare in childhood; its incidence rises rapidly in adolescence and attains a maximum between the ages of 30 and 40 years. Perforations are unduly common in December and relatively uncommon in August, September and October. This low incidence in the summer months may possibly have a nutritional basis or may be related to the holiday season. Perforations are less frequent on Sundays and Mondays than on other days. This may be related to rest at the week end. Perforations are unduly common between 3 p. m. and 6 p. m. and comparatively uncommon during the night and morning. There may be a correlation with periods of stress and rest respectively. The fatality rate from perforations increases with age and with delay in treatment. It is greater in gastric than in duodenal ulcer, in females than in males, in winter than in summer.

British Journal of Urology, London

16:81-124 (Sept.) 1944

Local Pathology in Enuresis and Its Treatment. H. P. Winsbury-White.—p. 81.
Extrusion and Strangulation of Ureterocele: Case. D. A. Abernethy. —p. 103.
Pelviureteral Impaction of Ureteric Catheter. G. E. Moloney.—p. 105.

Medical Journal of Australia, Sydney

2:373-396 (Oct. 7) 1944

*Bronchitis: Especially Chronic. R. S. Steel.—p. 373.
Cancer of Cervix Uteri, 1930-1942. H. H. Schlink and C. L. Chapman. —p. 377.
*Appendicitis in Its Relation to Pregnancy B. Johnson.—p. 379.

Bronchitis.—Steel studied 500 histories from records in which a diagnosis of chronic bronchitis was made. The only selection in this series was to exclude patients suffering from active pulmonary tuberculosis and from primary myocardial degeneration. All patients presented themselves with the symptoms of cough, varying in duration from five weeks to fifty years, or of cough and sputum, or of frequent "colds" in the head and chest, or of cough with shortness of breath, or of "asthma." During acute exacerbations the findings resemble those of acute bronchitis, with or without pyrexia, increased

sputum and increased rales and rhonchi. An acute exacerbation, especially in the adult, may run an afebrile course. Of 100 patients in the hospital only 23 were febrile on their admission, and 7 were slightly febrile. The remaining 70 patients were afebrile. In observations on the aforementioned 500 patients and on the 100 patients in the hospital, no etiologic agent has been isolated. The organisms found in the sputum and in the material from bronchoscopic suction were those which normally inhabit the nasopharynx. It is highly probable that the causative agent is intimately associated, if not identical, with the virus of the common cold. The organisms found in the sputum are secondary invaders. Diseased tonsils and adenoids should be removed from children irrespective of age. Abrupt temperature changes precipitate acute exacerbations throughout the year. The "hardening process" advocated by many fathers of bronchitic children has a number of dangers. Clinical impressions from the use of vaccines indicate their value when given in small weekly doses and sufficient to produce only a local reaction.

Appendicitis and Pregnancy.—The incidence of appendicitis in women is not influenced by pregnancy, Johnson says. Primary acute appendicitis occurs at the same rate in all women irrespective of whether a pregnancy is present or not. Although primary acute attacks of appendicitis are rare in pregnancy, an existing chronic appendicitis is unfavorably influenced by it. The course of acute appendicitis during pregnancy is rapid and perforation may occur within a few hours, especially in the later months. Diagnosis becomes increasingly difficult after the sixth month. When doubt exists, operation should be performed if the patient's general condition is grave. With early operation the maternal prognosis is good, but if perforation has occurred a mortality rate of 50 per cent must be expected. There is little danger of abortion in simple cases, but after perforation 50 per cent of uteri will empty themselves, thus increasing the mortality by 5 per cent. In the last two months perforation is extremely dangerous both to mother and to child. Cesarean section followed by appendectomy is advocated as the procedure most likely to give good results. The type of cesarean section depends on the extent of involvement of the parietal and uterine peritoneum. If involvement is very severe, Porro's operation is safest. In most other cases the lower segment operation will be best. Whenever possible the diseased appendix should be removed if there is a possibility of the occurrence of pregnancy.

Acta Medica Scandinavica, Stockholm

113:1-108 (Jan. 20) 1943

Response of Blood Prothrombin to Vitamin K as a Measure of Hepatic Function. P. F. Hansen and H. Begtrup.—p. 1.

*Comparative Study of the Occurrence of Complications in Scarlet Fever Treated With Sulfanilamide, Specific Immune Serum and Normal Horse Serum, with a Reference to Certain Clinical Features of the Material. F. Neukirch, V. Zahle and I. Baumgarten.—p. 11.

Iron Content of Serum in Patients with Pernicious Anemia. K. Brochner-Mortensen.—p. 43.

"Pure" Astereognosis: Report of 2 Cases. E. Mindus.—p. 58.

*Causes of Xerostomia. M. Faber.—p. 69.

*Treatment for Raynaud's Disease with 2-Benzyl-4,5 Imidazoline (Priscol Ciba). T. Lindquist.—p. 83.

Treatment of Scarlet Fever With Sulfanilamide, Specific Serum and Horse Serum.—Of 1,347 patients with acute, uncomplicated scarlet fever admitted to the Blegdam hospital during 1940, 318 were treated with sulfanilamide, 295 with anti-scarlet fever streptococcus serum and 118 with normal horse serum. The control group of 616 patients did not receive treatment. Sulfanilamide was employed by Neukirch and his associates, patients up to the ages of 4 years receiving 0.3 Gm. four times, those from 4 to 14 years 0.6 Gm. four times and those over 14 years 0.9 Gm. four times for eight days. Sulfanilamide had a definite effect in preventing complications, especially of the type considered bacterial, such as otitis and its late sequel mastoiditis. The incidence of these two complications was 3.8 and 1.2 respectively as compared with the control group, in which it was 8.8 and 3.2 respectively. Adenitis was reduced by a third, as was arthralgia; the incidence of peritonsillar abscess was reduced by three fourths and recurrences by about one third. Sinusitis and nephritis were only slightly influenced, and there was no effect on myocarditis. The drug had little or no effect on complications in the low age group (0 to 3 years). Sulfanilamide treatment as a routine is recommended as follows: The full dose employed by the authors is to be given during the first week and continued with half the dose for the next two weeks. The total dosage of sulfanilamide would therefore be about 20 Gm., 40 Gm. and 60 Gm. respectively in the age groups 0 to 3, 4 to 14 and over 14 years. Compared with the complications of the control group, those occurring in the sulfanilamide treated patients were delayed and in many cases appeared only when the sulfanilamide must be presumed to have been excreted. It seems likely that continued treatment would have the effect of reducing the complications still further, although untoward reactions may likewise be increased, since a larger number of patients may be sensitized. In the authors' cases these reactions were less frequent than those from serum treatment; they were less severe and less painful. Vomiting was observed in 23 cases (7.2 per cent). There was a rash in 41 cases (12.9 per cent) but never in the age group from 0 to 3 years, which comprised 65 patients. More serious reactions, such as leukopenia, severe hemolytic anemia and anuria, were not observed. Anti-scarlet fever streptococcus serum had no definite effect in preventing complications. Normal horse serum seemed to be ineffective. The clinical picture of this scarlet fever epidemic revealed that there may be a direct relationship between the toxicity of the initial phase and the incidence of complications, whereas there was no correlation between the incidence of complications and the degree of eruption and desquamation.

Causes of Xerostomia.—Faber reports 49 cases with reduced salivary secretion. In only one third of these could a definite diagnosis be easily made of the causes of reduced secretion. These were cases of diseases of the salivary glands, such as congenital aplasia of the parotid glands, epidemic parotitis, lymphogranuloma benigna and Mikulicz's syndrome. Roentgen treatment was the cause of decreased salivary secretion in 2 cases. In the rest it was possible to determine the cause of xerostomia in one half; these were cases of pernicious anemia, of sideropenic anemia and of ariboflavinosis. In some of the "idiopathic" cases a chronic inflammation was considered as maintaining a previously developed xerostomia. In the rest no cause could be given, but it is suggested that the reduced salivary secretion may depend on the endocrine glands, particularly at the time of the climacteric. In a rather large number of cases fissures in the corners of the mouth, atrophy of the mucous membrane of the tongue and pain in the tongue were found to be sequels of reduced salivary secretion.

Benzyl-Imidazoline in the Treatment of Raynaud's Disease.—Lindquist reports his experience with 2-benzyl-4,5 imidazoline hydrochloride in the treatment of 12 cases of Raynaud's disease of medium severity. Improvement in all cases was obtained from oral administration of the drug; 6 of the patients had no complaints, 3 had very little complaints and the condition of 3 additional patients was improved slightly. Untoward reactions such as vertigo and slight chills were of no importance. In 1 of the cases a dermatitis developed on the hands and feet. The eruption resembled that after prolonged histamine iontophoresis. The effect of benzyl-imidazoline was recorded by ascertaining the changes in the skin temperature at the finger tips. The patients remained at a room temperature of or slightly below 59 F. after their hands had been immersed in water of 59 F. A pronounced vasodilator effect was demonstrated on the hands of the patients to whom the drug was administered orally or intramuscularly before their hands had been immersed in the water, as compared with the hands of the controls. Treatment consisted in peroral administration of one tablet (0.025 Gm.) of the drug three times daily for several weeks. In some of the cases two tablets (0.050 Gm.) were given three times daily, and in addition a 10 per cent benzyl-imidazoline ointment was applied to the hands. There was no recurrence of the condition in some of the cases when the treatment was discontinued after the administration of forty tablets. Definite improvement in the blood perfusion of the fingers was obtained with the drug in an additional thirteenth case in which bilateral surgical removal of the inferior cervical ganglion, of the two superior thoracic ganglions and of the in between portion of the sympathetic nerve had been performed some time before. The vasodilator effect in this case suggests that the blood vessels may be affected directly by the drug or through the sensory nerves.

Book Notices

Medical Uses of Soap: A Symposium. By G. Thomas Halberstadt, B.S., Ch.E., and others. Edited by Morris Fishbein, M.D. Fabrikoid. Price, $3. Pp. 182, with 41 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1945.

This is a collection of uniformly excellent articles which tell the story of soap—its use and abuse, its chemistry and manufacture, its effects on normal and diseased skin, on the hair, for shaving, in industry—indeed the material goes well beyond the confines "Medical Uses of Soap." The symposium presents the views and experiences of men in the varied fields of dermatology, chemistry, bacteriology and industrial medicine, so that there is some duplication of material with occasional differences of opinion, but the result is a practical consideration of the subject.

The opening chapter on soap technology considers the chemical and physical properties of all types of soaps: toilet bars, household soaps, even the newer soapless detergents. The next four chapters deal with the use of soap on skin and hair. Consideration is given to the effect of soap on normal and diseased skin and to those diseases for which soap is indicated or contraindicated. The section which considers soaps for industry and the industrial worker is also very practical and thoroughly covers the whole field—skin inurement, patch tests, soap formulas, hygiene of workers—and includes a recital of illustrative case histories. There is an interesting discussion on soap for shaving in which the formulas of the various types of shaving soaps are furnished, and here too there is a section devoted to the use of shaving soap in the presence of certain skin diseases. A decalogue of fallacies answers some of the questions occasionally asked by patients. A section on cutaneous detergents other than soaps brings the subject up to date. This chapter discusses the various soap substitutes that have recently been introduced, the formulas, reasons for being, their advantages and disadvantages, their present status, and closes with the statement that "clinical experience up to now indicates that these detergents will be more widely used when a low cost cake form is developed which will lather and which has satisfactory physical properties." The final chapter deals in a general way with the medical uses of soap, as in first aid, venereal diseases and hygiene. The clinical chapters are illustrated in black and white, and there is a full index. Altogether the book is an excellent presentation that the physician should find not only interesting but useful.

A New Principle in the Treatment of Poliomyelitis. By Otto Meyer. Vol. A44-P, International Bulletin for Medical Research and Public Hygiene. Editor-in-Chief: W. L. Colze. Paper. Pp. 11. New York, Brussels & London: International Bulletin, 1944.

This short monograph is bad enough to warrant serious condemnation, although it is almost unthinkable that any intelligent physician could be influenced by it. The author builds up the theory that poliomyelitis is a streptococcic infection; that streptococcic infections cause latent jugular phlebitis, which in turn causes increased spinal fluid pressure, which in turn causes symptoms of meningeal irritation and paralysis. All this can be prevented by the simple expedient of the application of three or four leeches over each jugular vein! The final plea of the author is that this method does not "conflict with any other treatment."

Gynecological and Obstetrical Urology. By Houston S. Everett, A.B., A.M., M.D., Associate Professor of Gynecology, the Johns Hopkins University, Baltimore. Cloth. Price, $6. Pp. 517, with 220 illustrations. Baltimore: Williams & Wilkins Company, 1944.

This book, as its title implies, deals only with urology in women. The classification of the text is good, the subject and the chapters are well arranged and the many illustrations are excellent. This is especially true of the anatomic drawings. The book is easy to read, and at the end of each of the twenty-three chapters is a comprehensive bibliography. The book begins with a discussion of the anatomy and the physiology of the urinary organs, followed by a chapter on the relationship of urology to allied specialties. There are two chapters devoted to the various procedures in urologic examinations in which, in our opinion, too much detail on cystoscopic technic is given and not enough space devoted to a discussion of the physiologic principles of excretory urography, which is an important subject in a book of this kind. The remaining eighteen chapters deal with various urologic diseases. It would seem that more space should have been given to pyelitis of pregnancy. On the other hand, three chapters are devoted to ureteral obstructions, of which ureteral stricture is discussed in great detail. The frequency of this condition is still a debatable subject among urologists. Although it is questionable whether anything of importance has been brought out in this book that is not included in any good general book on urology, the book can be recommended because of the completeness with which it has handled some of the urologic diseases that are common to women.

Malaria: Its Diagnosis, Treatment and Prophylaxis. By William N. Bispham, Colonel, U. S. Army, Retired. Cloth. Price, $3.50. Pp. 197, with 5 plates. Baltimore: Williams & Wilkins Company, 1944.

With great numbers of the armed forces in tropical and semi-tropical areas and many chances to contract tropical diseases, it is important that the practitioner should be informed of the present status of one of the most important of these diseases. Dr. Bispham has done this by presenting the picture of malaria so that the practitioner will have a thorough, practical knowledge of the disease. The author's complete description in the chapters on pathology, symptomatology and treatment give a picture of the disease of its most recent advances up to the present time. Dr. Bispham has made use of the leading authorities to review many sections of the book and has also included an interesting chapter on the prevention and treatment of malaria in West Africa in recent years by Comdr. L. T. Coggeshall (MC), U.S.N.R. The volume is highly recommended to students, malariologists and practitioners.

Essentials of Pharmacology and Materia Medica for Nurses. By Albert J. Gilbert, M.D., Instructor of Pharmacology, Aultman School of Nursing, Canton, Ohio, and Selma Moody, R.N., Instructor in Nursing Arts, The Presbyterian Hospital of the City of Chicago. Second edition. Cloth. Price, $2.50. Pp. 290, with 20 illustrations. St. Louis: C. V. Mosby Company, 1944.

According to the preface of the first edition, "the object of this little volume is to present the facts and theories of pharmacology and materia medica for nurses in a lucid, concise form, adapted to the limited time available for the course in many nursing schools. . . . Where the larger texts are used, this book may be helpful in reviewing pharmacology and materia medica." There are available a number of books intended for the nursing profession; some of them are unnecessarily complete, others are too brief and sometimes inaccurate. The authors of most of the books, however, apparently realize that the object in teaching pharmacology and materia medica for nurses is to provide information on how the drugs are used and what they may be expected to do; not to provide a book so complete in details that the nurse is receiving as thorough instruction as the medical student. Where to draw the line is a difficult decision in some instances, but the present book seems sufficiently brief to be not objectionable to the student nurse and yet sufficiently complete to provide necessary information, especially when the authors' warning concerning the concurrent use of textbooks is heeded. A few questionable statements appear, but the general conservative presentation compensates for such faults. One does wonder however if it is necessary to devote in a book of this sort fifteen pages to arithmetical problems. Particular emphasis is placed on official and new and nonofficial drugs, but some of the newer generally recognized drugs such as sulfamerazine and sulfapyrazine are not mentioned. The index seems adequate.

The Recording of Sickness Absence in Industry (A Preliminary Report). By a Sub-Committee of the Industrial Health Research Board. Medical Research Council, Industrial Health Research Board Report No. 85. Paper. Price, 4d. Pp. 17. London: His Majesty's Stationery Office, 1944.

The Industrial Health Research Board, in recognition of the need for adequate industrial medical records, has issued these instructions for recording sickness absenteeism. All necessary forms and descriptions of procedure for entering and calculating statistical data are included. It performs for Great Britain what has been instituted in this country by the Division of Industrial Hygiene in the United States Public Health Service.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

SMALL STATURE OF THIRTEEN YEAR OLD GIRL

***To the Editor:*—A girl aged 13, 4 feet 8½ inches (143 cm.) tall and weighing 109 pounds (49 Kg.) is embarrassed at her small stature; in the last year she has not grown at all. She has normal pubic and axillary hair growths; her breasts are rather well developed; she has been menstruating for two years. Her parents are 5 feet 3 inches (160 cm.) tall and their parents were not much taller, although some of the child's uncles and aunts are tall. Do you feel that any medication is indicated?**

Morris B. Schwartzfarb, M.D., Bronx, N. Y.

ANSWER.—It is probable that this girl is far enough along in adolescent development so that the epiphyses and diaphyses of the long bones have united and that further growth in height will not occur. Under such circumstances as described it is important that a simple x-ray film of the femur be made so that the epiphyses at either end can be seen: if the epiphysial line shows that union is not yet complete, further growth may be achieved; if these epiphyses are united, no further growth is possible.

In case the epiphyses are found open and it is considered desirable to stimulate growth, it is important to look into the nutritional background and be certain that it is adequate in every way. The presence of chronic disease should be eliminated. Then the decision must be made as to whether the patient is clinically deficient in thyroid and if so this deficiency made up. Barring these three possibilities, there remains the attempt to stimulate growth with anterior pituitary extract. There is still some doubt as to the efficacy of pituitary derivatives, but clinical trials of special extracts, standardized by the manufacturers in their capacities to stimulate the growth of experimental animals, might be worth while. Such material is introduced hypodermically and must be used daily for really effective results; the achievement of growth could not be demonstrated in less than three months—perhaps in not less than six to twelve months.

VALVULAR MURMURS IN RHEUMATIC HEART DISEASE

***To the Editor:*—In a large percentage of patients with early rheumatic fever at this center a soft blowing systolic murmur is heard only at the third and fourth left interspaces just to the left of the sternum; or the murmur may be heard over the entire precordium but is heard best at the third and fourth left interspaces just to the left of the sternum. What valve or valves are involved, and what is the pathologic condition?**

Noah N. Feldman, Lieut. Comdr. (MC), U.S.N.R.

ANSWER.—Soft blowing systolic murmurs heard only or heard best at the third and fourth left interspaces just to the left of the sternum are present in normal persons as well as in patients suffering from rheumatic fever (types 2 and 3 of Paul). The significance of such murmurs is extremely difficult to evaluate. The mechanism of the production of such murmurs in normal persons has never been satisfactorily explained. In patients suffering from rheumatic fever, the presence of such murmurs has been explained by an early lesion of the aortic valve (Hamilton and Thomson). Such murmurs are to be distinguished from high pitched, occasionally harsh systolic murmurs heard over the midprecordium, with maximum intensity in the region of the apex of the heart (type 1 of Paul). These are frequently found in patients suffering from active rheumatic carditis. The usual pathologic explanation for the latter variety is a dilatation of the mitral ring due to myocarditis, associated with roughening of the edges and commissures of the mitral valve.

The important point about systolic murmurs in the diagnosis of rheumatic fever is that alone they are an unreliable means for such diagnosis. On the other hand diastolic murmurs, i. e. a short early blowing murmur heard best over the second right interspace, over the sternum or over the third or fourth left interspaces, or a low pitched rumbling crescendo murmur followed by an accentuated first sound at the apex are highly significant in the diagnosis of rheumatic heart disease. Systolic murmurs are apt to be more significant when they change from day to day and are particularly significant when they appear during the course of rheumatic fever and were known not to have been present prior to that event. Thus the changing character of the murmur, its harshness and its high pitched character, with maximum intensity in the region of the apex, tend toward a diagnosis of an organic lesion.

The relationship between the importance of a systolic murmur in the diagnosis of rheumatic fever and other symptoms and signs was well summarized by T. Duckett Jones in THE JOURNAL, Oct. 21, 1944, page 481. In that paper Dr. Jones stressed the difficulty of the diagnosis of rheumatic fever and separated the major criteria for diagnosis from minor criteria. One of his major criteria is carditis as determined by cardiac enlargement, significant murmurs, i. e. diastolic murmurs or apical high pitched systolic murmurs, pericarditis or the presence of congestive heart failure. In general symptoms and signs other than the type of murmur described in the question must be present to establish a diagnosis of rheumatic fever or rheumatic heart disease, since such murmurs are so often found in normal persons.

References:

Paul, J. R., and other contributors: The Epidemiology of Rheumatic Fever and Some of Its Public Health Aspects, ed. 2, American Heart Association, Section B, pp. 143-145.

Hamilton, B. E., and Thomson, K. J.: The Heart in Pregnancy and the Child-Bearing Age, Boston, Little, Brown & Co., 1941, pp. 32-34 and 130.

BRONCHIAL ASTHMA AND TESTOSTERONE

***To the Editor:*—I am advised that testosterone has been used in the treatment of asthma of unknown cause with excellent results. Will you kindly advise me regarding this form of treatment?**

Elmer W. Clarke, M.D., Norton, Mass.

ANSWER.—Although in many persons there is a relationship between the endocrine system and bronchial asthma, little benefit has resulted from the use of glandular products. References to the use of testosterone in the treatment of bronchial asthma have been meager. Two successful reports follow, but experience is so limited that optimism is not warranted:

The Cleveland Clinic (Allergy in Clinical Practice, Philadelphia, J. B. Lippincott Company, 1941, pp. 297-298) reports that a man aged 46 with sexual impotence had suffered from bronchial asthma for two years despite treatment. He then received testosterone propionate in 25 mg. doses three times weekly for the impotence: the asthma disappeared completely, except for an occasional "wheeze," and the potency returned to normal. The efficacy of the male sex hormone in controlling the asthma was demonstrated repeatedly: withdrawal of the therapy for as little as ten days resulted in a recurrence of the asthma, and three weeks without treatment terminated in severe asthma. When the patient was requested to have a complete allergic investigation he refused because his symptoms were controlled by androgen therapy.

La Fitte and Guttières reported (*Bull. méd.*, Paris **54**:284 [June 8] 1940) that a girl aged 19 years had suffered from severe asthmatic crises for six years. The asthma first appeared at the age of 3 years, was mild and disappeared after several months, not to reappear till the onset of menstruation at 13 years of age. Then she had severe asthmatic attacks always about eight hours before the onset of the menstrual flow. The menstruation was very painful, irregular and excessive in amount. No associated premenstrual breast pain or engorgement was experienced. No treatment had helped the asthma. Examination revealed no endocrine or genital abnormality; her general health was excellent. The authors tried testosterone, postulating a hyperfollicular syndrome: they gave five intramuscular injections of testosterone acetate without any other treatment. The asthma ceased, and she was given three monthly series of five injections each, from twelve to twenty days following menstruation, after which she had no asthmatic attacks and her menstrual periods became regular and painless. For the past six months, in spite of being without further treatment, she has been free from asthma and menstrual abnormalities.

AMMONIA AND THE NERVOUS SYSTEM

***To the Editor:*—I have 3 patients who were overcome with ammonia gas or fumes while at work; 3 of their companions died from the effect. The 3 who survived have eye injuries and pains in the abdomen; the most prominent symptom in all seems to be intense nervousness and hysterical excitement. Exposure occurred on Aug. 31, 1944, when the connection of a car of ammonia was broken while unloading. What are the pathologic effects of ammonia on the nervous system?**

S. Ross Jones, M.D., Port Arthur, Texas.

ANSWER.—Ammonia is not considered to have a direct action on the central nervous system. The present condition of these patients is probably a neurologic and psychologic response to the tissue damage produced by the original acute exposure to ammonia gas and to the serious results of the original episode on their companions and themselves.